



# **NATIONAL ACTION PLAN TO COMBAT DESERTIFICATION/ LAND DEGRADATION AND TO MITIGATE AGAINST DROUGHT**

**REPUBLIC OF THE FIJI ISLANDS**

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## **EXECUTIVE SUMMARY**

The Fiji's economy suffered severely as a result of the political crises of May, 2000, when civilians took command of the Parliament and held Government parliamentarians hostage for four months. The resultant deterioration in international and national confidence coupled with sharp increase in skilled workers migration led to productivity decline.

A new Government of the Republic of Fiji was voted back to power in September, 2001 and moved quickly to curb this trend with the formulation and implementation of a multi-sectoral National Strategic Development Plan for the medium term covering the period between 2002 to 2004. The gist and thrust of this plan is based on the collective responsibility of rebuilding confidence, stability and growth. It will guide the future investment in infrastructure, capacity building and resources management which will have multiplier effects on the economic growth, poverty alleviation and sustainable development.

There is an urgent need to implement policies that will ensure that development is sustainable in the true spirit of constructive cooperation between the appropriate sectors. This spirit is reflected in the Agenda 21, the internationally agreed action program of 1992 United Nation Conference in Rio De Janeiro and the ensuing UN Commission created at Rio to monitor the progress at national and international level. It also reinforces Fiji's commitment as a signatory to the United Nation Convention to Combat Desertification (UNCCD), United Nation Framework for Climate Change (UNFCCC) and United Nation Convention for Bio-Diversity (UNCBD).

Fiji has recognised that land resources development and management as one of the key development issues identified in the National Strategic Development Plan. The unsustainable uses of the resources due to increase in population and encroachment of marginal to steep land for agriculture and other uses have caused land degradation. This due mainly to increase deforestation, logging, intensive sloping land cultivation and livestock farming. The consequences of this unsustainable practices have resulted in Fiji requesting donors for technical and financial assistance for the formulation and implementations of plans and strategies such as the Integrated Watershed Management Plan, National Plan for Natural Disaster Management and others plans to be able to reduce or minimises unsustainable uses of resources.

Even though Fiji has ratified the UNCCD it has yet to formulate its National Action Program (NAP) but it has been involved with several multilateral, bilateral and nationally funded scientific and technical activities or initiatives which would create synergies when the NAP is formulated and implemented to combat desertification in this case the land degradation and drought mitigation. Scientific activities and initiatives such as the Soil Surveys and Soil Correlation was funded by New Zealand Overseas Development Assistance (NZODA) to classify soils according to the International Soil Taxonomy Classification for the purpose of agro-technology transfer, identification of different soil types, its chemical components for

accurate recommendation of fertiliser application and the matching of soil types, slopes and crop types for sustainable land and water resources use. But these initiatives and activities are not sustainable due mainly to unsustainable financial and technical support by the national government and international partners.

The Ministry of Agriculture, Fisheries and Forest became the National Focal Point for the UNCCD when Fiji ratified the Convention in 1998. But after the General Election in September, 2001, a newly elected Government was created and established a separate Ministry of Fisheries and Forests. The Ministry of Agriculture includes Sugar and Land Resettlement (MASLR) in its portfolio and it has also created a new Department of Land Resources Planning and Development. These new developments clearly indicate the government's commitment to the sustainable development and management of its land and water resources. MASLR is also charged with the administration of the Agriculture Landlord and Tenants Act of 1976, the Land Development Act of 1961 and the Land Conservation and Improvement Act of 1953.

The Land Conservation Board (LCB) of Fiji is the National Coordinating Body (NCB) which is charged to exercise general supervision over land and water resources in Fiji under the Land Conservation Improvement Act of 1953. The Land Use Section of the Department of Land Resources Planning and Development provides the Secretarial services to the Board. The Permanent Secretary for Agriculture, Sugar and Land Resettlement is the Chairman of the LCB.

In early 2002, the LCB proposed for an amendment that the Land Conservation Improvement Act of 1953 to be reconstituted as the Land and Water Resources Management Act and its Board to be renamed as the Land and Water Resources Management Board of Fiji. The amendment also affects the membership of the Board where it has proposed for an increase in the members from nine (9) to fourteen (14) members to include a wider stakeholder participation and institute gender balance.

The amendment of the Act had proposed that the Board to be independently resourced both human and financial to be more efficient and effective in carrying out its functions. It has also broaden its function to include the formulation and supervision of a National Land Use Plan and the reconstitution of the Conservation Committee to be the Land Use and Conservation Committee. The function of the Board will compliment the Natural Resources Management functions of the Sustainable Development Bill.

The government recognises that there are twelve (12) pieces of legislation already in existence which are relevant to land development and conservation which are administered by different government agencies and have overlapping function. Therefore the government through the Department of Environment drafted the Sustainable Development Bill which is an omnibus legislation to compliment the existing legislation in all areas of environment management. The Bill when enacted will be known as the Sustainable Development Act.

MASLR with the assistance of the South Pacific Community/ GTZ Regional Project had reviewed the rural land use in Fiji and its findings were documented in the "Review of the Rural Land Use: Opportunity for the New Millennium", which consists of the analysis of the previous studies, current legislation guidelines and implementation responsibilities, land use practices, issues and impacts, land resources information and the processes to facilitate

change. This study was a prerequisite to the formulation of the National Rural Land Use Policy which will be used as the guide to the formulation and implementation of the National Land Use Master Plan.

Fiji has emphasised the importance of capacity building across all sectors as a cornerstone in the achievement of sustainable development through better education and training and creation of public awareness concerning sustainable development. It is a very important issue that needs to be addressed both at local and national level. Government, non government agencies, civil societies and other stakeholders have assisted in one way or another by technical and financial assistance to realise these challenges but there are still a lot of room for improvement in terms of sustainability of the programs with both technical and financial assistance from international partners.

The Fiji government have increased its Ministry of Education's budget from F\$39 million to F\$217 million clearly indicating the focus of the current government. It had also seek assistance from international partners for the creation and preparation of the training and awareness materials such as video, leaflets, posters, video clips which have been distributed and shown to farmers, school children, landowners and the public at large to spread the gospel of sustainable land and water resources development.

The Fiji government has not officially formulated the National Action Plan (NAP) for UNCCD and it requires technical assistance from the UNCCD Secretariat for the formulation of its NAP. But in recognising the importance of sustainable development of its land and water resources, it created a new Department of Land Resources Planning and Development within MASLR and had identified the land resources development and management sector as a key development issue in the National Development Strategic Plan( NDSP) for the medium term from 2002 to 2004 which will be the basis for the long term sustainable development strategies.

To ensure that all stakeholders are involved in the formulation and implementation of sustainable land management policies, strategies, the participatory rural appraisal and multi-stakeholders consultation meetings are techniques used for soliciting stakeholders views. The existing Indigenous Fijian and Indo-Fijian institutional framework fully supports multi-stakeholder consultation and consensus building initiatives.

Fiji fully supports and participates in initiatives created for sustainable land development and management for the Pacific region it was part of the International Board for Sloping Land Research and Management (IBSRAM) Pacificland Network program which was funded by the Asian Development Bank and later AUSAID, a program which involves six Pacific Island Countries (PICs) and currently it is involved with the SPC/GTZ Forestry and Agroforestry Program which involves eight PICs. But the PICs need more concerted efforts and recognition of their impeding resources management issues by their sub-regional partners such as the South Pacific Community, South Pacific Regional Environment Program, the South Pacific Forum Secretariat and international partners such as the Food and Agriculture Organisation (FAO), Australia Development Assistance Program AUSAID, New Zealand Overseas Development Assistance (NZODA), Japanese International Corporation Agency (JICA), European Union (EU), United Nation Development Program(UNDP), Global Environment Facility(GEF) and others to assist in the formulation of multilateral or

bilateral efforts to move the process of sustainable land development and management forward.

The availability of reliable land resources information such as geology, soils, land use capability classification, climate, vegetation, topography, water resources and the land tenure is vital, if sustainable land development and management policies are to be developed. Fiji is very fortunate that these information are widely available. There are also established monitoring and observation capacities that are already in existence such as the Fiji Land Information Council, the Forest Management Information System, the MASLR Geographical Information System (GIS) and the Meteorological Observation and Early Warning Systems. But there is a critical need for an information system for land degradation and desertification at national level where technical and financial assistance from international partners is needed.

## ACRONYMS

UNCCD	-	United Nation Convention to Combat Desertification/Land Degradation
UNFCC	-	United Nation Framework Convention for Climate Change
UNCBD	-	United Nation Convention for Biological Diversity
GOF	-	Government of Fiji
CDF	-	Commodity Development Framework
ADP	-	Agriculture Development Program
ALTA	-	Agriculture Landlord and Tenants Act
USDA	-	United States Department of Agriculture
GDP	-	Gross Domestic Product
MASLR	-	Ministry of Agriculture, Sugar and land Resettlement
MAFF	-	Ministry of Agriculture, Fisheries and Forest
SCOF	-	Sugar Commission of Fiji
NCLOP	-	National Code of Logging Practice
LDRU	-	Land Development and Resettlement Unit
NLTB	-	Native Land Trust Board
TCPD	-	Town and Country Planning Department
LCB	-	Land Conservation Board
FSC	-	Fiji Sugar Corporation
FSLC	-	Fiji School Leaving Certificate
JICA	-	Japanese International Corporation Agency
NBSAP	-	National Biodiversity Strategy and Action Plan
FTDP	-	Fiji Tourism Development Plan
SPC	-	Secretariat of the Pacific Community
GTZ	-	German Technical Co-operation

WWF	-	World Wide Fund
DSAP	-	Development of Sustainable Agriculture Program
FSPI	-	Foundation of the
NAP	-	National Action Program

## 1.0 INTRODUCTION

The United Nation Convention to Combat Desertification (UNCCD), which entered into force on the 26<sup>th</sup> of December, 1996, provides the international community with a framework for the sustainable development and management of its land resources. The objective of the Convention is to secure the long - term commitment of the parties through a legally binding document. It provides an international framework for the countries affected by desertification/ land degradation to work in partnership with industrialized countries to implement their National Action Program. The Convention is a very powerful instrument for the sustainable natural resources management in affected regions and for ensuring long-term mandatory external support for these efforts.

The Convention is founded on the principle that the solutions for the problems of desertification /land degradation and drought should emanate from affected populations, supported by partnership with other concerned actors, both national and international. These solutions and supporting partnerships are undertaken within the National Action Program process as the main instrument for the implementation of the UNCCD at national level.

Technical measures alone cannot win the battle against desertification or land degradation. Efforts to combat desertification / land degradation must therefore be integral components of the national development strategies.

National Action program should define long term strategies and priorities together with the required legal and institutional frameworks. This should also be mainstreamed into the country's National Strategic Development Plan (NSDP).

The United Nation Convention to Combat Desertification/ Land Degradation (UNCCD) arose out of the 1992 Earth Summit, the United Nation Conference on Environment and Development held in Rio, in which Fiji participated and became the consensus that adopted the Agenda 21.

The African countries had wanted the problems of desertification /land degradation and drought be included as part of the United Nation Convention for Climate Change to which the Pacific Island Countries were totally against that because the UNFCCC was already too broad and such a significant issue deserves a serious attention. It was then decided that combating desertification and mitigating the effect of drought requires a separate Convention and therefore the UNCCD was adopted in Paris, France in June, 1994.

Desertification means land degradation in arid, semi arid and dry sub-humid areas resulting from various factors, including climatic variations and human activities. Land degradation means reduction or loss, in arid, semi arid and dry sub humid areas, of the biological or economic productivity and complexity of rainfed croplands, irrigated cropland or range or pastures, forest and woodlands resulting from land uses or from process or combination of processes, including processes arising from human activities and habitation patterns.

Fiji acceded the United Nation Convention to Combat Desertification on the 26<sup>th</sup> of August, 1998 after experiencing serious case of an El Nino drought which caused millions of dollars of damages to the agriculture sector especially the sugar cane industry and the increase in land degradation caused by increase in population and encroachment of our marginal to steep land areas for intensive agriculture.

## 2.0 COUNTRY BACKGROUND

### 2.1 The Land

The Republic of the Fiji Islands as clearly shown on Map 1 comprises an enormous archipelago with diverse landscapes and climate. Contrasts between the wet and dry sides of the large islands, and between landscapes that reflect different rock types, and different erosion and depositional histories are best appreciated from the air. The archipelago, comprising over 340 islands, lies between 12° (Rotuma) and 22° (Ono-i-lau) south and between longitude 175° east and 178° west. The area included within these limits exceeds 650,000 km<sup>2</sup>, but of this, 18,300 km<sup>2</sup>, or less than 3%, is dry land. Islands vary in size from Viti Levu, the largest, which occupies 10,388 km<sup>2</sup> to small, unnamed islets, some little more than rocks and sandy cays. Vanua Levu, the second largest island, has an area of 5,535 km<sup>2</sup>; thus the area of the two main islands represents 87% of the total land area. About 105 islands are inhabited.

The larger volcanic islands are dominated by steep, deeply incised mountainous terrain. The highest summit, Tomaniivi (Mt Victoria), is 1323 m; there are 30 peaks over 1000 m. Table 1 sets out the balance of land based on slope classes. The land use capability (LUC) classes for each category based on the Fiji LUC classification system (1977) are also included. There is a sharp contrast in Viti Levu between the steep mountainous terrain (67%) and the flat land (16%) of the coastal plains and river deltas. The latter are the main areas of settlement and production. A great many of these plains, but not all, are subject to inundation during periods of prolonged rain in the interior. Undulating to rolling land (4–15°) makes up 17% of the Viti Levu land area. A similar terrain distribution pattern occurs in Vanua Levu (Table 1) but with a larger area of steepland.

**Table 1: Slope and LUC classes**

Slope group(s)	LUC Class	Viti Levu	Vanua Levu
Flat (0–3°)	I	16%	15%

Undulating to rolling (4–15°)	II – IV	17%	13%
Steepland (16°+)	V – VIII	67%	72%

Source: Twyford and Wright 1965, *Fiji Land Use Capability Classification 1977*

Geologically, the islands of Fiji have formed from volcanic materials and sedimentary rocks deposited towards the eastern margin of a massive oceanic plate or platform of great age. The Fiji landscape results from an intricate series of processes that constructed and shaped these rocks. These geological processes have operated over millions of years and are still active – earthquakes are not uncommon and occur on active fault systems. In geological terms the extensive volcanic eruptions in Rotuma, Koro, and Taveuni Islands are youthful events, and raised limestone reef and alluvial terraces indicate crustal mobility.

The natural geological erosion rate in Fiji is high because of the youthful landscape, lithologies and the uneven topography. Galletly and Swartz (1974) calculated the erosion index (EI) to be very high – 700 for the dry zone and 800 for wet zone – and high by world standards where EIs average between 200 and 400. Where EIs exceed 500, extreme care is required in agricultural land, irrespective of soil type. In general, erodibility increases from the dark coloured Inceptisols with swelling clays to the red, strongly weathered Oxisols at the other extreme. The authors state, ‘By world standards, land with slopes greater than 8° would be considered incapable of growing sugar without unacceptable damage.’

## 2.2 Land utilisation classes

The basis for this classification is whether land in its natural state is suitable for agriculture or not and, if not, how much modification is necessary to render the land suitable. The following categories were proposed:

**Table 2: Major land utilisation categories (%)**

Class	Viti Levu	Vanua Levu	Total Fiji
I	21.46	14.66	19.36
II	7.67	12.61	10.51
III	29.01	41.67	31.93
IV	41.86	31.06	38.20
<b>Total (%)</b>	<b>100</b>	<b>100</b>	<b>100</b>

Sources: Twyford and Wright (1965).

The first major category (I) may be described as first-class land in that it is considered suitable without modification for some form of land use, although the particular kinds of usage are not specified. This is to avoid the fallacy that, in a group of mountainous islands, particular forms of land use are ‘higher’ than others. Good cocoa, mango or *dalo* land is just as first-class as good cane land in that ‘first class’ returns can be achieved if the land is properly farmed. It is evident that only 355,902 ha in Fiji (19.4%) fall into this category. In Viti Levu, the proportion is 21.5% whilst in Vanua Levu it is only 14.7%.

Category II may be thought of as second-class land, i.e. good land if some fairly minor improvements are made. There are 193,277 ha of these soils in Fiji (10.5%); 7.67% of Viti Levu is of this class, 12.6% of Vanua Levu and as much as 42.8% of Taveuni. (This land is mostly that for which minor conservation works would be required on the predominantly steep slopes if the potentially very productive soils were fully developed; the figure compensates for the perhaps surprisingly low proportion of first-class land).

Category III lands, of which there are 587,002 ha (31.9%), are third-class lands in that they need a great deal of attention before they can be adequately developed and fully utilised. Many of these lands may be truly described as 'problem soils'. They cover a larger area than both of the 'good' groups of soils added together – a fact that highlights the difficulties that must be overcome in any expansion of agriculture. Category III lands lie chiefly in the two main islands, especially in Vanua Levu (41.7%; Viti Levu has 29.0%).

Finally, the largest class of all comprises the 702,391 ha of category IV lands, those considered quite unsuitable for agricultural development according to present knowledge, though they may be of limited use for productive forestry. No less than 38.2% of Fiji is composed of these poor classes of land. Viti Levu has the largest proportion of this type of land (41.8%) and Taveuni the smallest (24.4%). The proportion of Vanua Levu that consists of category IV land is 31%.

The total amount of class I and II soils in Fiji is 549,179 ha or 29.9% of the total land area. This is the extent of the area for sustainable agricultural land use, i.e. those classes of land for which moderate to no modification is needed before they can be developed fully for some form of agriculture. However, these soils are mainly those on which current agriculture already exists, so that much of the possible new development lies in the agronomic and land conservation improvement of present practices. An accurate present land use survey would show how much undeveloped land is available that is easy to farm. Commonly there is more than one subclass type recognised and an Arabic numeral is added to the subclass symbol (for example, III E 1; III E 2).

### 2.3 Climate

Fiji lies within the tropical belt but towards the southern margin, at distances ranging from 1800 to 2500 km from the equator. Although Fiji's climate is described as tropical, it is not uniform across the islands due to the relief of the high islands and the impact of the easterly maritime airstream – known as the 'South East Trades'. This airstream predominates throughout eight months of the year. Seasonally, climate ranges from hot and dry to warm and wet. From April to November – the period of the SE Trades – the windward lowland regions of the main islands experience cloudy conditions, frequent rain, a moderate amount of sunshine and even temperatures. The leeward lowland regions are dry, with clear skies, a limited temperature range and abundant sunshine. The smaller and low-relief islands generally have a climate that approximates that of the leeward or dry regions. Mean monthly temperature ranges from 23°C in July and August to 27°C in January; humidity from 75% during winter to 88% in summer.

## 2.4 Vegetation

At one time Fiji was virtually covered with forest (Twyford and Wright 1965). The present plant cover forms a complex mosaic comprising fernland, open grassland, reed grass, shrubland, a savannah-like transitional vegetation and tall forest. The areas of open grassland, fernland, and reed grass and savannah are largely man-induced and, when given complete protection from fire and other interference (particularly by humans), the ecological succession shows a slow but steady return towards a forest cover. However, the extensive areas of the introduced mission grass seen in the dry zones are considered to be a fire climax association and will therefore not return to forest unless there is some intervention such as re-forestation.

## 2.5 Soils

Detailed information for the specific soil series is found in the Soil Taxonomic Unit Description Sheets (STUDs) (Leslie and Seru 1998). The soil pattern for Fiji shows 65% of soils develop on steep slopes ( $>21^\circ$ ), 20% on rolling and hilly land ( $4-21^\circ$ ) and 15% on flat land ( $<4^\circ$ ).

Soils of the uplands are separated from those of the lowlands to reflect the different soil temperature regimes above and below 600 m altitude. Soil temperature has a major influence on plant growth. Similarly soil moisture regimes further influence land use and crop options and are used as primary criteria for differentiating soils between the dry, wet and very wet moisture zones. Soils are further subdivided into the general type of genetic process that produced them and their resultant soil profile. They are generally called by the name in the soil legend that accompanies the soil maps (Leslie and Seru 1998).

Young, very sandy soils from various coastal deposits are found on or near the shores of the islands. Soil of the regularly inundated coastal flats, at or near the mean tide level, fringe significant areas of the main islands and for the most part support mangrove forest marsh. Free-draining soils derived from river deposits occupy valley floors. These are generally fertile, deep and agriculturally valuable. Soils with high water tables and impeded internal drainage occupy low-lying depressions in valleys and on terraces and peneplains. In shallow depressions where the water table lies at the surface during much of the year, peats formed from rush and fern develop. Often some of the most developed soil profiles are found on near flat, stable remnants of old peneplain surfaces and very old river terraces. Those from non-acidic rocks have deep red profiles often with subsoil mottling and iron oxide concretions in the upper horizons. These represent the most advanced stage of soil development from non-acidic parent materials. Profiles from acid rocks are commonly in high rainfall areas and tend to be yellow mottled red, clayey and not well drained.

The other soils not included in the foregoing groups occur on sloping land. Soils from:

- *Young volcanic materials* have silty, deep profiles with unweathered parent material still present but are fertile and excellent cropping soils;
- *Volcanic ash over reef limestone* have silty thin profiles with good physical properties on rock but, due to shallowness, have limitations of rooting volume and droughtiness;

- *Calcareous tuffs and marls* have shallow black profiles, are nutrient rich and mainly used for pasture because of shallowness. This group can be subdivided into those that occur in the wet zone and those found in the dry zone;
- *Older weathered volcanic rocks* occur mainly in the dry zones and are typified by deep, friable, bouldery clays from basalt. They are generally fertile with a high base status.

### 2.5.1 Soil Erodibility

The soils of Fiji falls under 10 soil orders of the USDA Soil Taxonomy Classifications with its equivalent as classified by Twyford and Wright with its erodibility ratings. The soil erodibility ranges from low to severe but about 60% of the soil types rates from high to severe.

<b>TWYFORD AND WRIGHT CLASSIFICATION</b>	<b>USDA</b>	<b>CLASSIFICATION</b>	<b>SOIL ERODIBILITY</b>
	<b>ORDER</b>	<b>SUBORDER</b>	
<b>Recent Soil from Coastal Sands.</b>	<b>Entisol Inceptisol</b>	<b>Psammment Tropept</b>	<b>Moderate</b>
Recent Soils from Alluvium	Entisol Inceptisol	Aquent Tropept Aquept	Low
	Mollisols	Udoll Aquoll Ustoll	Low
Nigrescent Soils	Inceptisol	Tropept	High to Severe
	Mollisols	Ustoll	High to Severe
	Vertisols	Ustert	High to Severe
Latosolic Soils	Andisols	Udand	Moderate
	Inceptisols	Tropept	Moderate
Humic Latosols Soils	Inceptisols	Tropept	High
	Alfisols	Udalf	High
	Ultisols	Humult	High
Ferruginous Latosol Soils	Oxisols Ultisols Inceptisols	Ustox Ustult Tropept	Severe Severe Severe
Red Yellow Podsolc Soil	Ultisols  Inceptisols	Humult Ustults Tropept	High High High
Gley Soils	Inceptisols	Aquept Tropept	Moderate Moderate
Organic Soils	Histosols	Fibrist	Severe
Saline soils of the Marine Marsh	Entisols Inceptisols	Aquent Aquept	High High

### 2.6 The economy

The Fiji economy has a very narrow base and performance is heavily dependent on the success of the tourism and sugar industries. The sugar industry remains the largest contributor to total domestic export earnings with sugar representing 36.7% in 1996. Exports of traditional commodities such as *dalo* (taro), kava and coconut oil are also growing due to increasing demand in niche markets. Forestry is also expected to grow and export earnings from this sector are expected to rise to \$100 million by the year 2000. However, agriculture remains the mainstay and the largest sector of Fiji's economy, accounting for almost 43% of foreign exchange earnings. It provides nearly 50% of total employment and contributes 19% of Fiji's GDP. The forestry sector contributes 2.5% of GDP and some \$50 million foreign exchange annually. Forest products are now the fifth most important export commodity.

There is a significant degree of uncertainty surrounding the issue of land that has to some extent affected investment in the farm sector. There is also concern at the likely erosion of preferential access for sugar into the European market. This will mean productive, higher-cost farms are unlikely to be viable. This is also affecting the investment climate.

Political and external factors have significant impact on the rural economy and indirectly on land utilisation and land use change. Current impacts of importance to the rural sector include:

- Cyclones – the recent one-in-100-year drought and industrial disputes have seen a serious decline in sugar production. However, the year 2000 cane crop was one of the largest ever.
- Similarly, a decrease in rural investment due to the uncertainty about renewal of leases for land use for sugar cane production has adversely affected the agriculture sector.
- The Government of Fiji (GOF) devalued the currency by 20% in January 1998 in an attempt to increase the competitiveness of Fiji's export products.
- The new constitution and readmission of Fiji to the Commonwealth will most likely see an improvement in the domestic and foreign direct investment and a decline in the rate of emigration.
- While an increase in exports is forecast with economic activity growing by 2–3%, global trade liberalisation policies could have adverse effects on the sugar industry because of the preferential trade arrangements provided by the sugar protocol under the Lomé Convention of the EU.
- Land tenure issues related to expiration of ALTA leases; some 6496 leases are due to expire by 2005.
- Policy measures are available to the newly formed Department of Land Resources Planning and Development of MASLR to resolve the problem of possible displacement of a large number of ALTA leaseholders over a short period of time.
- Inconsistencies and uncertainty of government policies discourage private sector investment in agriculture. The Agricultural Development Programme (ADP), which replaced the Commodity Development Framework (CDF) in 2000, is one example of government initiatives that are inconsistent with its stated aim of reducing the level of involvement in the economy, in particular direct production and investment (by MAFF).

A 12-point strategy for growth in the agricultural sector was identified by an ADB-funded Agriculture Sector Study in 1995 and endorsed by Cabinet in 1996. These points have been incorporated into the sector's overall policy and strategies. The essential components are:

- Promoting export development through market-oriented expansion, intensification and diversification of agricultural production;
- Encouraging the transformation from subsistence to commercial farming;
- Emphasising on-farm demonstration;
- Revitalising agriculture research and improving access to technology;
- Infrastructure development;
- Industry organisation, and industry self-management;
- Encouraging the private sector to invest in agricultural development;
- Ensuring environmental sustainability through education programs on the negative consequences of burning, enforcement of existing laws and regulations relating to environment protection, and creating awareness of the adverse consequences of the excessive use of chemicals.

## 2.7 The People

The population of Fiji in December 1996 was 772,655, with Fijians comprising 51.1% of the total. Indo-Fijians comprised 43.6% and the balance was made up of Rotumans, Chinese, Europeans and other Pacific Islanders. While 54% of the total population live in rural areas, migration to the urban areas is significant and increasing. In 1986, the urban population was 39% of the total population, increasing to 46% by 1996. Almost 50% of the total increase in the urban population occurred in the Central Division. This trend in urbanisation is having a major impact on agricultural land in the peri-urban zones.

In the 40-year period 1956 to 1996, total population increased by 427,655 (124%) and the land used for agriculture increased by 178,259 ha to 393,272 ha; clearly an increasing number of people had turned to the land for their livelihood. However, the total rural population declined by 23,826, or about 5%, in 1996 compared to 1986. Thus, the rural population has been declining over the last 10 years by an annual average of 0.6% per annum with the Indo-Fijian component of the rural population showing the greatest decline as a result of urbanisation and emigration. Both out-migration and in-migration are related to the degree of urbanisation in the provinces. Provinces with no urban centres have the highest out-migration.

Movements from one rural area to another are influenced largely by economic factors such as the seasonal migration to sugar cane and ginger growing areas. The rural-to-urban migration is of concern to government and to reduce the trend, efforts will be directed at raising living standards in rural areas, stimulating the growth of small farms and creating employment through improved infrastructure and other services.

The large informal sector of mainly self-employed persons in very small enterprises outside any fixed working place, plus the agriculture sector comprising self-employed agricultural workers and seasonally employed wage workers, accounted for about 58% of the total labour force in 1996.

## 2.8 Agriculture

Components of the agriculture sector in the broadest sense include arable farming (including subsistence cropping), livestock, fishing and forestry (including indigenous). For the purpose of this discussion, fishing is excluded in order to focus on the land-based elements of the agriculture sector.

MASLR recognises agriculture's importance to the economy and the rural community and in its strategic plan has committed itself to the sustainable development of Fiji's primary sector resources. Environment, poverty alleviation, women in development, management of natural resources, greater diversification and export enhancement are deemed crucial in supporting growth and sustainable development.

### 2.8.1 *Farming Assistance and Land Resettlement Program*

The Department of Land Resources Planning and Development is also involved in a program which assists farmers whose agricultural leases have expired and wish to continue with agriculture within Fiji. .

Here the Department is responsible for :

- ✓ the coordination of sustainable land development and management of Fiji's land resources and the amendment of the Land Conservation and Improvement Act
- ✓ the Farming Assistance Program which was approved by the Fiji Government Cabinet in November,2000. It is aimed at assisting the incoming landowner farmer and outgoing tenants of expired ALTA leases.

A total of 13,140 leases will expire between 1997 and 2028. The exodus of people from the agricultural sector will not only have an adverse effect on this sector but also poses other social and economic problems for the government. There is already evidence of urban squatter problems. If the government does not find a solution to this effect, additional social and economic problems will burden the nation. This will have a drastic effect on the already problematic infrastructure in Fiji's towns and cities and the creation of more new squatter settlements.

The assistance is given in the form of grants of up to F\$10,000.00(US\$5,000.00). The FAS has five different forms of assistance which are as follows;

- ✓ Rural Residential Lease, where the government pays for the lease premium of not more than F\$10,000.00(US\$5,000.00) for the residential sites where the farmer had built his house, in the property he or she had leased for the past 30 years or so before the lease expires.
- ✓ Lease Renewal, where the farmer or ALTA tenant have been given an extension to his or her lease holding for another thirty years, the government pays for the premium of the lease of up to F\$10,000.00( US\$5,000.00).
- ✓ Replacement farmer, where the government gives assistance to the Fijian landowner farmer to develop the reverted property for sugar cane or for other crops.

- ✓ Resettled farmer, where the government gives assistance to ex-ALTA tenant farmer by providing alternative land through its resettlement program. The government has purchased freehold land and had developed infrastructure (roads, electricity and water supply) as well as subdividing the land for each tenant. The land is transferred the State.

The Department of Land Resources Planning and Development also has a land development program to resettle these evicted tenants.

This program is expected to continue until an amicable solution is derived, through the negotiation between the government and the main political parties in the country, to resolve the relevant land tenure legislations.

### 2.8.2 *Alternative Livelihood Project*

The Alternative Livelihood Project (ALP) focuses on increasing the sustainability of on and off-farm livelihoods to those affected during the restructuring of sugar industry and to reduce rural poverty. The objectives of the project is to maintain a healthy agriculture structure with viable alternatives to sugar cane farming, to generate sustainable off-farm work and self employment opportunities for farmers leaving sugar cane farming and for other rural poor; to provide access to savings and credits facilities in rural areas and to provide much needed farm access infrastructure to rural dwellers. The project covers the sugar cane belts and nearby rural and peri-urban areas of Western Viti-Levu and Vanua levu. It also targets groups that includes sugar cane farmers, cane cutters, mill workers, landowners and indigenous Fijians. The project includes poor people not involved in sugar cane farming and will also address the needs of households including women in relation to on and off-farm livelihood activities.

### 2.8.3 *Sugar*

Raw sugar accounts for about 40% of the total merchandise exports and around 12% of GDP. The industry directly engages about one fifth of the total labour force and creates significant multiplier effects. Sugar production has declined in recent years. Droughts, cyclones and industrial disputes have had a direct impact on sugar production. A priority for the industry is to fully implement the strategies described in the Sugar Industry Strategic Plan (SCOF 1997). The seven primary function areas are: communication, investment, quality control, railway restructuring, productivity incentives, new technology and reconstruction of industry organisations.

Sugar cane cultivation is responsible for the most widespread land degradation. The current cultivation of sugar cane on the marginal areas is clearly an unsustainable practice. On Viti Levu alone, nearly 15,000 hectares of sugar cane have already been identified as requiring urgent soil conservation work and a further 6,500 hectares should be retired from sugar cane and put to a less erosive form of land use.

### 2.8.4 *Other crops*

*Copra*: After many years of declining production, copra output increased in late 1996 due mainly to improved world prices. Replanting of senile palms with high yielding hybrid

varieties has begun in Vanua Levu, Taveuni and Lau Province. Logs from senile palms are being used in a highly successful export-oriented furniture manufacturing business and for coconut timber.

*Fruits:* Mango, pawpaw and pineapple offer considerable export potential, particularly in Australia and New Zealand. In 1996, mango production was 70 t, pawpaw 37 t and pineapple 2161 t. Opportunities also exist for value-added products such as freshly prepared pouched fruits, dried fruits, fruit juices and purees.

*Root crops:* Potentially lucrative export opportunities exist for export of root crops and *yaqona* (kava), provided continuity of supply and quality are maintained. Apart from fresh exports, opportunities exist for value-added exports such as *dalo* chips, *dalo* flour, and processed baby food. For *yaqona*, two primary markets have been established – one for raw material to the pharmaceutical industry in Europe and the USA, the other as a beverage for Pacific Island communities. Ginger is now a major diversification crop but is experiencing increased competition from other ginger producing countries. Ginger production figures for 1996 were: mature 1140 t, immature 1080 t. Niche export markets for cut flowers and spices are being encouraged under CDF.

**Table 3: Agricultural commodity production (1996)**  
(tonnes) by area and number of farmers

Crop	Area (ha)	Farmers (number)	Production (tonnes)
Sugar	73,900	22,337	453,000
Coconut	64,953	n.a.	11,003 (copra)
Cocoa	578	2220	126 (dry bean)
Ginger: Mature	24	700	1140
Green	46		1080
Rice	8411	11,320	18,888
Pineapple	193	1428	2161
Vegetables/Fruits	4280	14,320	22,000
Root crops:			
<i>Dalo</i>	2400	n.a.	22,613
Yam	428	n.a.	4401
Cassava	2610	n.a.	40,247
<i>Kawai/Kumala</i>	1328	n.a.	7821
Yaqona	2200	n.a.	2,685

Source: MAFF 1996 Annual Report

The crop sector is vulnerable to cyclones, flooding and droughts. Other constraints include unorganised markets, insufficient credit, poor quality-control, quarantine restrictions, high freight charges and a shortage of quality planting materials. Some of the more controllable problems are being addressed by CDF. There is also a potential for vegetable export, with the

development of bilateral quarantine agreements and the establishment of a hot-air treatment facility at Nadi Airport.

### *2.8.5 Livestock*

*Beef:* Commercial beef production has declined, despite initiatives to develop several beef schemes (Uluisaivou, Yaqara, Yalavou) over the last 30 years. While Fiji is self-sufficient in the lower grade beef, much of the high-quality cuts used by the hotel industry are imported. There are plans by MAFF to increase efforts to improve pasture quality, provide improved genetic material to farmers and to support downstream industries, such as the leather industry.

*Dairy:* Domestic production has been poor, with continued heavy reliance on imported milk powder and butter. Fiji is currently around 10% self-sufficient in dairy products. The CDF programme is being utilised for pasture development, improved milking facilities, roading, water supply and training.

*Sheep:* Sheep for meat are now well integrated into other livestock and crop farming systems. Production is not sufficient to meet local demand and large quantities of sheep meat are imported. Domestic production is constrained by poor pastures and internal parasites.

The major constraints facing the livestock industry relate to poor-quality pastures, the high cost of feed concentrates, the unavailability of good-quality breeding stock and high mortality rates. These have all contributed to low fertility rates and productivity at farm level. There is scope to substantially increase beef production through improving management in existing farms, greater encouragement of grazing under coconuts (as in Vanuatu) and more attention to product pricing. Discouraging bush and backyard slaughtering can also increase the output of hides. The domestic whole-milk producers will continue to operate after full deregulation. The sheep industry has a good future with increased willingness of farmers to purchase and rear locally bred sheep. Sheep can also be integrated into a variety of farming systems.

## 2.9 Forestry

The forestry sector currently contributes 2.5% of GDP and some \$50 million in foreign exchange annually. Forest products are now the fifth most important export commodity. Earnings from this sector in foreign exchange were expected to increase by approximately \$100 million by the year 2000 as plantation hardwood processing commenced, generating more than 4000 rural jobs.

Over the last five years, in addition to continuing the replanting of *Pinus caribaea* and hardwoods, the sector has also focused on processing, marketing and the export of forest products. Fiji's mahogany plantings, which amount to approximately 50,000 ha in area (38,850 ha in eastern Viti Levu, 11,000 ha in the Northern Division), are recognised as possibly the most valuable in the world. Other hardwood plantings comprise 11,000 ha.

The inventory of the indigenous forest resource was completed in 1995. These indigenous forests cover 858,000 ha, representing 47.5% of Fiji's total land area. The government fully supports the sustainable use of the forest resources but at all times giving full consideration to the interests of stakeholders. Fiji has a real opportunity to implement sustainable forest management on an economically viable basis given all the 'ingredients' are put together.

The rate of deforestation is modest compared to that in some neighbouring Pacific nations. Also, the institutional structure does not allow direct dealing between logging companies and landowners and there is a long-standing ban on round-log exports. The pine softwood plantations have been an environmentally positive development providing ground cover to a large area of degraded soils. The enrichment mahogany plantings in the wet zone combined with the pine plantations might have minimised the need to harvest the remaining natural forest, but the interest in logging indigenous forest is still high.

Some of the threats to forest resources include the growing incidence of wild fires, environmental damage resulting from inadequate enforcement of the National Code of Logging Practice (NCOLP) and direct landowner dealings with logging companies. At the time of introduction of NCOLP in 1990 there remained only 15% of indigenous forest not yet logged and suitable for production forestry.

#### 2.10 Land development and resettlement

Over the period 1997–2028, approximately 13,141 leases issued under the Agricultural Landlord and Tenant Act (ALTA) will expire. MASLR's Land Development and Resettlement Unit (LDRU) was established in 1998 to develop and make available land for farmers whose leases have expired. The unit has begun the process of determining the number of farmers requiring resettlement and identifying land for development. Current indicators are that only 3500 farmers (30%) will require resettlement. To date, several properties have been purchased (in Nadroga, Serua, Namosi, and Macuata), which will accommodate approximately 300 farmers.

Some potential negative impacts include: shortage of good land in suitable locations, unwillingness of farmers to move to new areas, and a lack of credit to the agricultural sector. However, there are real opportunities for high returns from non-sugar agricultural commodities if the resettlement program can be implemented smoothly.

#### 2.11 Regional and rural development

Fiji's rural area is important for the economy as it represents over 50% of the population. Fiji's geographical spread, remoteness from markets, vulnerability to natural disasters, high cost of transportation and communication constraints between urban and rural areas constitute significant development challenges. Although socio-economic development has improved dramatically over the last three decades, considerable disparity still exists in the distribution of the benefits. This is further exacerbated by increasing levels of unemployment, low literacy rates and poor living conditions that disadvantage rural as opposed to urban populations. Furthermore, poverty is common in some rural areas. Many rural areas/regions offer good prospects for development, given their potential to generate

commercial investment. It will be necessary to market the potential of rural areas/regions in investment promotion program. There is an urgency to create employment opportunities in the rural areas. Rural growth and development is highly dependent on improved infrastructure.

## 2.12 Tourism Development

Although tourism is the country's largest contributor to economic growth, investment, and foreign exchanges earnings with nearly 17% of the GDP

### **3.0 WHAT IS LAND DEGRADATION?**

Land degradation as defined by the UNCCD Convention in Article 1 as;

“reduction or loss, in semi arid and dry sub humid areas, of the biological or economic productivity and complexity of rainfed cropland, irrigated cropland, or large, pasture, forest and woodlands resulting from land uses or from a process or combination of processes, including processes arising from human activities and habitation patterns such as;

- i) soil erosion caused by wind and or water
- ii) deterioration of the physical, chemical and biological or economic properties of soil and
- iii) long term loss of natural vegetation.”

GEF Operational Program 15 (OP15) defines land degradation as;

“any form of natural potential of land that affects ecosystem integrity either in terms of reducing its sustainable ecological productivity or in terms of its native biological richness and maintenance of resilience”

In summary land degradation is defined as;

“A reduction in land productivity that affects the integrity of an ecosystem through, erosion, salinisation, loss of soil fertility and the like. Prevention and control of land degradation, especially desertification and deforestation, are critical to achieving sustainable development at the national and global environmental levels.”

Land degradation differs from soil degradation in that the process affects multiple components of an ecosystem, and is usually discernable and must be addressed at multiple spatial scales. Land degradation damages the soil structure.

#### 3.1 Causes of Land Degradation in Fiji

##### *3.1.1 Direct Causes of Land Degradation*

###### *3.1.1.1 Deforestation*

Deforestation has slowed but it is continuing under a more controlled regime despite introduction of the National Code of Logging Practice. Since 1967, up to 140,000 ha of Fiji's forest has been converted to non-forest land uses. Unsustainable logging practice is the clear felling of the forest trees and vegetation followed by burning, all in the guise of rural development. There are six principle causes of deforestation in Fiji:

- clearing of forest associated with a large-scale commercial (agriculture) rural development project;
- the continuing small but steady growth of smallholder agriculture involving mixed commercial and subsistence farming;
- the continuing spread of small villages and settlements;
- urban growth and infrastructure to service these areas (road, dams, bridges, reservoir);
- fire; and
- bad logging practices followed by land clearance.

### ***3.1.1.2 Unsustainable Logging***

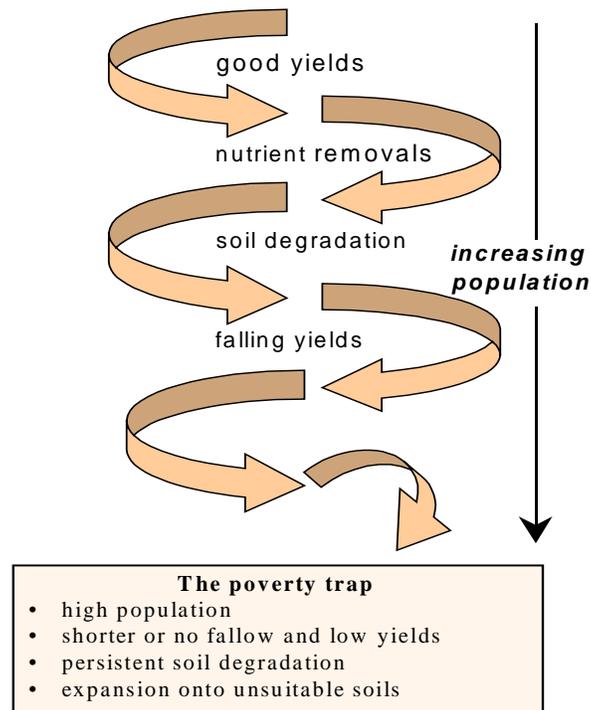
The over exploitation of forest for timber is also a factor of deforestation. Logging itself does not necessarily permanently reduce forest cover. Poor logging practices however can and do affect the ability of forest to regenerate. Heavy disturbance of forests is still occurring and this type tends to encourage clearance for agricultural purposes. More dense forests are under less stress. The unplanned alignment of logging roads have on-site and off-site consequences to the environment such as erosion on road embankments, which causes siltation of creeks and depletion of biodiversity in the river ecosystems. These practices, both within and outside logging concession areas have significantly affected forest quality and biodiversity to the detriment of both forest cover (through erosion) and subsequently, forest-based industries.

### ***3.1.1.3 Intensive sloping land cultivation***

Increased population, low availability of fertile arable land and the encroachment onto fertile arable land for non-agricultural purposes such as urban expansion, has forced farmers to use sloping marginal steep land.

Intensified use of marginal steep land areas leads to shorter fallow periods and ultimately to soil degradation and reduced crop yields from those crops such as sugar cane, ginger and *dalo* grown on sloping land with crops planted up and down slopes (rather than across the slope). This induces on-site land degradation, soil erosion, loss of plant nutrients, increased pest and disease infestation, reduction in soil depth, decreased soil water-holding capacity and rill and gully erosion. This gives rise to an unsustainable cropping system that ultimately leads to poverty (Figure1). Off-site effects include increased siltation in the river systems, formation of mud banks, reduced navigability of rivers, destruction of fish spawning areas, reduced fish populations and flash floods during heavy rains. The latter cause damage to infrastructure costing millions of dollars in rehabilitation, sometimes loss of life and increasing destruction of coral reefs.

**Figure 1: The downward spiral to the poverty trap**



*From: Cherish the Earth, FAO, 1994.*

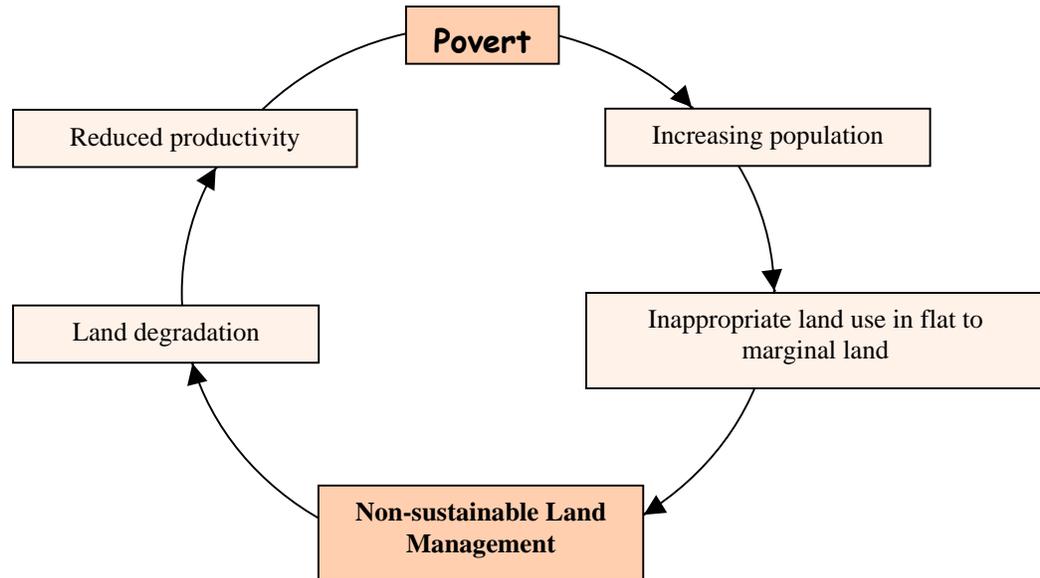
#### **3.1.1.4 Intensive flat land cultivation**

Commercial and intensive farming on flat land often includes total clearing of forest and land for mono-cropping. It is the concentration of high-production output on a short-term basis, without consideration for the soil resources or 'best practice' farming, which results in unsustainable use.

The large-scale intensive and continuous cropping with crops like sugar cane, *dalo*, maize, ginger and others on flatland depletes the soil of plant nutrients and increases the dependence on expensive fertilisers. During heavy rainfall, the leaching and overland flow of the fertilisers and farm chemicals into rivers and ground water causes water pollution. As for sugar cane, the burning of trash after harvesting destroys micro-organisms and the organic matter on the soil surface. Tractors can cause compaction of the soil and an increase in bulk density that results in poor crop growth and low infiltration rates during heavy rain. Compaction is also an issue associated with logging operations.

The consequences of these practices result in a reduction in farm income that in turn can lead to the beginning of the cycle of poverty (Figure 2).

**Figure 2: The vicious cycle of land degradation**



*From: The Conservation of Lands in Asia and the Pacific, FAO, 1992*

### ***3.1.1.5 Commercial livestock farming***

The commercialization of livestock farming without good pasture management, with unfenced paddocks and overstocking, leads to a situation where the land and animal feed is out of balance or the carrying capacity of the pasture is low. This results in soil erosion on steep marginal areas. Land degradation compounds when mature grass cover is burnt repeatedly to create young grass shoots that are palatable for livestock. Burning is usually done just before the onset of the wet season, therefore causing soil losses and mass movement. Another major problem is the accumulation of tonnes of animal waste that usually finds its way into streams and rivers causing pollution of waterways.

### ***3.1.1.6 Reclamation of freshwater swamps***

The reclamation and draining of freshwater swamps for rice and other agriculture development has proven to be unsustainable due to the high input costs of maintaining drains and other infrastructure. It also destroys habitats of endangered animals or birds.

### ***3.1.1.7 Reclamation of mangrove swamps***

The draining of large tracts of mangrove swamps for agriculture and housing development is expensive and unsuitable. Acid sulphate soils are prohibitively expensive to ameliorate for

cropping. This practice has resulted in financial losses (in addition to the loss of mangrove so crucial for local subsistence villagers) plus the destruction of fish-spawning grounds and an overall loss of biodiversity.

#### ***3.1.1.8 Ad Hoc Urban development***

Increase in population and the continuous influx from rural to urban areas have resulted in significant urban development and encroachment onto first-class arable land.

The change of government policy from a strategy of import substitution, self sufficiency and heavy involvement of government to a strategy of export-led growth has changed agricultural land use. First-class land is now being used for private investment in developments such as housing, garment industries, tourism and others. For example, in the corridor between Nadi Town and Nadi Airport about 500 ha of first-class sugar cane land has been taken for non-agricultural purposes. The following are examples of the land use practices that occur within the urban and peri-urban areas.

##### ***Hotels***

In the quest for more earnings from tourism, Fiji has to regulate the type of hotel development best suited for particular ecosystems.

Reclamation of entire mangrove islands also impacts adversely on nearby areas used as a source of landfill material. Also deserving of special consideration is the role of large hotels as pollution sources that harm water quality and upset the hydrological regime.

##### ***Housing***

An increasing source of irritation nowadays relates both to the siting of housing schemes and the methods of landscaping observed. Earthmoving and levelling operations should be evaluated seriously, as they tend to overload waterways with all forms of debris. Eventually such debris finds its way to the coast and upsets the ecosystems. Sewerage also needs to be properly treated before being released into lagoons.

##### ***Ports***

Development of port facilities in Fiji is being stepped up. Ports are developed on delicate coastal ecosystems. It is observed that large areas of mangrove swamps are currently being drained for this purpose. Consequent oil spills and changes to wave or current action trends may feature unfavourably in nearby areas in terms of coastal erosion and extermination of several species of baywater and coastal fisheries.

##### ***Airports***

Most of the airports are developed on prime agriculture land. Besides encroaching on the nation's agricultural land, airport development displaces people as it creates noise pollution spreading to adjacent settlements. Though desirable for modern travel, impacts should be properly assessed and cost/benefit analyses carried out as such development displaces people and creates unpleasant side effects, such as sale of farmlands for non-rural real estate and rural-to-urban migration.

##### ***Highways and roads***

Recent work on highways and roads demonstrates scant regard for measures to divert water safely into areas that are environmentally safe. Where a large part of the population relies on potable water, sources of regular, quality water are vital. Stabilisation of road embankments through 'greening' programmes is commonly ignored.

### ***Towns***

A continuing aspect of urban development is the way settlements continue to sprawl onto food-producing first-class land. Under current policies and legislation this trend will escalate, potentially to the point where it could impact on national efforts to develop agriculture with an export orientation on value-added, agro-based industries. As evident, it is necessary only to look at the environment of Fiji's major cities and towns to see land previously used for sugar cane areas, rice fields, vegetable and root crop farms taken out of production; there seems to be no end to this. The guiding principles in such developments are nearly always the economy of sewerage, electricity, roading and water reticulation systems. Even the location of ecologically sensible garbage dump sites causes a lot of discussion (not to say an outcry) from affected population groups.

### ***Manufacturing industries***

Current siting of manufacturing industries is, in many cases, visually unacceptable. Wastes emanate from industrial processing – these could be gaseous, solid or liquid. The way in which these wastes are produced and disposed of are crucial environmental planning issues. Waste-producing industries of significance are cement plants (dust), sugar mills (soot), agro- and timber-processing plants (chemically contaminated waste water) and oil spills from rusted discarded cars, machinery and equipment.

### ***Energy***

The creation of artificial lakes for the harvesting of electrical energy, even to meet current national requirements, is already creating problems for people who gave land away in good faith for such purposes. The problem stemmed from too much emphasis on economic rates of recovery and little to negligible attention on social impacts of the long-term welfare of landowners. The solution lies really in suitable engineering design specifications to prevent the unpredicted flood of upstream areas where people plant their crops, e.g. in Nadrau where the Monasavu Dam is situated.

### ***Mining***

The mining industry does not have guidelines like NCOLP for the timber industries and there is an urgent need to develop standards. The environmental impact survey of the Mount Kasi open gold mine indicated significant ramifications for the surrounding environment, Yanawai River and coral reef ecosystems. The long-term impact of the mining works – especially where mine tailings are deposited – and other environmental effects will have long-term consequences. The mining of coral for export has had devastating effects on coral reef ecosystems.

## 3.2 Indirect Causes of Land Degradation

### 3.2.1 *Demographic changes*

The increase in Fiji's population over recent decades has placed pressure on the land, particularly marginal land, and this has resulted in significant land degradation and soil erosion.

While the majority (54%) of the population still lives in rural areas, there has been an absolute decline in the rural population over the last decade due to the rural to urban migration; a trend that is driven by perceived prospects of employment, problems of access to rural land, limited income-generating opportunities and poorer services and infrastructure in the rural areas. The amount of unused land suitable for development is quite small and land use competition is becoming increasingly intense. The uneven distribution of arable land has resulted in some localised demographic imbalances. The environmental impacts of uncontrolled urbanisation combined with land degradation are seriously impacting on the quality of living and the sustainable income-generating capacity of Fiji's natural resources.

Land availability and land quality, land tenure, labour mobilisation, depopulation in some outer islands and sugar cane areas and, in the Fijian village context, a changing balance between subsistence and commercial agriculture are all factors contributing to fewer people being supported directly in primary production.

It is becoming more difficult to absorb (at a satisfactory level of living) within the subsistence farming sector those who cannot find work in the urban or fully commercial rural sectors. The conversion from subsistence to commercial agriculture and the inferior quality of each parcel of land brought into use have meant that the average new rural family requires more land than their predecessors did. The small size of farm holdings (60% are less than 3 ha) forces farmers into intensive cultivation (often mono-cropping) for high-output, short-term production without or with only minimal fallow periods.

### 3.2.2 *Pressure on the production base*

Apart from the commercial crops (sugar, ginger, *yaqona*, *dalo*) most farmers are locked into subsistence production or root crops, pulses and rice, not a diverse farming system involving a mix of crops (perennials, fruit and nut trees plus the subsistence crops) that would increase income and self-reliance. Market crops have higher value and perennials are more appropriate for soils prone to erosion.

Because of competition and pressure for land, subsistence gardens are increasingly being relocated onto steeper slopes because of the expansion of cash cropping and grazing on the flatter lands. Some gardens experience soil loss, especially when traditional mulching is not practised and fallow periods are too short.

Soil loss measurements clearly demonstrate that the agricultural productive base in many sugar cane areas, and with ginger on slopes, is declining at a rate that is well above what would be regarded as economically acceptable.

The new system of cash cropping is not sustainable. The method here is to move into a new area, clear a relatively large block (10–20 ha) by slash and burn methods, cultivate the land until depleted of nutrients and eroded and then, if more land can be leased, move to a new area and repeat the process.

Goat grazing areas are invariably overstocked and show bare eroded patches due to the typical farmer's need to recoup expenses as quickly as possible and an ignorance of controlled grazing techniques.

### **3.2.3 *Over-dependence on the sugar industry***

The country's high dependence on the sugar industry and its quota and incentive system encourage cane farmers to move onto slopes greater than 11° and, commonly, to not practise any soil conservation measures. Over a short period of time, many of these areas experience soil depletion, soil moisture deficits and decreasing productivity. Where land degradation has become extreme, farmers are forced into growing non-cane crops or foregoing leases. Overall the sugar industry is experiencing declining productivity and industry efficiency. Sugar prices have declined, there is little new investment into the sector, there are growing uncertainties about land tenure and there is a high level of farmer indebtedness.

There is a prevalent attitude that a soil's only function is to physically support the cane crop – all nutrient inputs are artificial – and there is scant regard for the soil's role as a 'bank' for moisture and nutrients. FSC (apart from recent Taiwanese assistance) has long ceased research into soil conservation. This is in a situation where estimates point to 15,000 ha of cane land on Viti Levu being in urgent need of soil conservation works and a further 6500 ha that should not be in cane at all.

### **3.2.4 *Use of appropriate technologies***

Pressures on land indicate an urgency to increase sustainable production per unit area. However, there is poor understanding throughout the agriculture sector about a much closer matching between land use/crop type and land capability if productivity goals are to be met. There is very low farmer participation in technology generation.

The use of vetiver grass planted along the contour in the cane belt was a widely promoted practice until 30 years ago. The Fiji model for the use of vetiver grass is described widely in world soil conservation literature; unfortunately, this is no longer the case with only a fraction of vetiver grass areas remaining. It is a proven technique to control soil movement and loss on sloping land.

The burning of cane trash, while illegal, is a widespread practice and over repeated years, combined with long fallows every four to five years, results in serious depletion of fertility and soil loss. Trash is burnt, and then follows a period where the soil surface is bare and exposed to high-intensity rainfall. This period coincides with the wet season and on sloping land commonly results in severe sheet erosion.

Mission grass areas are burnt each season. The grass ‘browns off’ early and when fired at late growth stage, the entire cover is lost due to total combustion and extremely hot fires. This results in a high percentage of bare ground (mission grass dominates, with other species smothered) and exposure to rainfall impact. There is a widespread culture of burning and a growing incidence of wild fires in the indigenous forests and pine plantations.

In the 1960s, up to 140,000 ha of Fiji’s forests were converted to non-forest land use with loss of forest cover leading to serious soil degradation. This was particularly so where logged areas had no subsequent management. Here the incidence of mass movement and soil erosion is high. In many cases, forest logging practices have caused avoidable environmental damage (the National Code of Logging Practice has been adopted – but its enforcement is often inadequate).

Because of the predominantly poor adoption and application of land husbandry practices and the resultant degradation of the land and water resources, the impact of natural disasters is becoming increasingly more acute, in particular, vulnerability to droughts and flooding. The unplanned alignment of mining and logging roads has both on-site and off-site consequences on the environment with siltation of creeks and runoff surges during storm events.

#### *3.2.5 Lack of physical infrastructure*

Too many rural areas have poor roading, utilities, transport (to market) and social services – all disincentives to follow anything other than a subsistence lifestyle.

#### *3.2.6 Weak institutional infrastructure*

There is serious under-resourcing by Government for line Ministries having responsibility for agriculture, forestry and land use in general. The public sector commonly lacks effective funding, resources and trained technical staff to undertake environmental planning, management and enforcement. Expertise in the areas of agricultural extension, soil conservation, land use planning and environmental planning, management and enforcement is below critical mass in the responsible line ministries. The resources devoted to soil conservation are inadequate for the implementation of significant measures, either in terms of providing information or incentives.

FSC has no staff designated as soil conservation officers and the institutional memory of land husbandry practices is poor due to the current age structure. Prior to Fiji’s independence, CSR and MAFF had some 60 conservation officers between them, the majority by far with CSR.

NLTB receives poor technical support from MAFF Land Use Section and Department of Forestry by way of expertise about soils and land capability, advice and field inspections relating to the land husbandry clauses in NLTB leases. As a consequence, NLTB is reluctant to exercise its legal rights with respect to bad land husbandry practices.

The Land Conservation Board has no public profile and there is little understanding about its role and responsibilities; yet it is charged with an enormous national task. The LCB has been ineffective for a number of years and did not meet for six years in the 1970s. The Board is in urgent need of revitalisation concurrent with a national awareness programme. The primary responsibility of the LCB is the 'supervision over land and water resources' (as per the Land Conservation and Improvement Act, 1953) yet expenditure has been on coastal zone/floodplain drainage schemes, not toward solving the causal factors responsible for the downstream problems.

The Land Conservation Board is not acting on the powers vested in it and while the Board has 'ownership' of the problems and solutions there is minimal government support and intervention for the Board to fully implement its 'powers to exercise general supervision over land and water resources'. This is not a recent phenomenon, but rather a situation that has prevailed for 20 years or more. With regard to the scope of the Board's work, little attention has ever been given to the issues of water yield and quality.

Environmental issues are not well addressed in the planning process. There is no national level planning and environmental policy guidelines backed by legislation. It is therefore difficult for TCPD to consider or action environmental needs at the divisional and local planning level. Environmental analysis is currently not a requirement in the planning system nor is an environmental impact assessment (EIA) on land development proposals before decisions are made. MAFF Land Use Section activities, due in part to limited resources, are mainly directed at planning land use with regard to production potential rather than to longer-term land degradation issues.

There is a poor awareness of the interdependence of conservation and development. There are widely held views in some influential ministries that conservation and environmental management are obstacles to development or at best irrelevant to it.

Land conservation is generally ineffective because there is no strong executive authority in a co-ordinating role, nor is there close integration between Government departments and other stakeholders, and there is an absence of any strong political will.

### *3.2.7 Water resources*

Land use planning for the future is not possible unless there is some co-ordination of the best use of Fiji's water and land resources, particularly with population growth that is causing competition for the use of the same limited resources. Part of this process should involve a review of the various ordinances that control the nation's water and land resources.

Planners and decision-makers ought to ask searching questions about water resources and their development. Questions might include: What are the demands on water resources? Are the water resources sufficient to meet these demands? Where are the resources, how extensive are they and how are they currently utilised? Are the present uses sustainable? If not, what are the constraints on more sustainable use? Answers to such questions are rarely simple. Some questions can only be answered by integrating environmental, social and economic information.

Water scarcity is about more than the decreasing availability of this resource. The increase of pollution and, to a lesser extent, salinity in water are other pressing issues. This contamination makes plentiful water supplies unfit for drinking, or for agricultural or environmental purposes.

In some lowland parts of Fiji, flood control and salinity mitigation are required for raising agricultural productivity. Drainage works are essential to allow cultivation of other low-lying areas subject to waterlogging.

There is a general lack of specialised knowledge about ground water and a limited awareness of the importance of water resources management as a technical and policy issue.

Primary Government objectives for the water resources sector should ideally encourage efficient use and integrated management of water resources at the catchment (river basin) level; improve flood warning and protection; reduce water pollution; undertake priority water resource development projects (e.g. irrigation schemes in the 'dry' zones); and promote financial self-sufficiency. Key steps to be taken for the achievement of these objectives are policy and institutional reforms to improve water resource management.

Policy on water resources management should emphasise the following principles:

- (i) Water resources are managed and developed in a comprehensive integrated manner and cross-sectoral issues are considered with the goal of ensuring the sustainability of the water environment for multiple uses as an integral part of Fiji's economic development process;
- (ii) Water resources planning and management are carried out recognising the interrelationships between water, land and human resources with the objective of enhancing economic growth and development in an environmentally sustainable manner;
- (iii) Water is an economic resource and therefore should be managed in an economically efficient manner;
- (iv) The catchment (river basin) should be the basic unit for planning and managing water resources;
- (v) Water users should participate directly in water resources management and development; and
- (vi) Water use should be efficient and environmentally sustainable.

Irrigation on appropriate soils for intensive cropping has potential to significantly increase productivity per unit of land given proven water resources are available to support irrigation. Integrated 'dryland' measures that farmers can adopt can result in soil moisture savings and increased agricultural yields. These include land-levelling, non-tillage in the dry season, deep ploughing in the wet season, mulching and overall improved management measures.

### *3.2.8 Inappropriate land use in watersheds*

Erosion resulting from inappropriate land use and land management practices in watersheds has led to progressive siltation of rivers resulting in deterioration of drainage on floodplains, frequent inundation and the formation of shallow bars across the river mouths. Dredging of

rivers has become a very costly necessity. Land degradation in watersheds causes peak flows in rivers during high-intensity storms. This results in downstream sedimentation and flooding with serious implications for settlements, domestic water supplies, infrastructure (roads, bridges) and crops. There is general lack of attention by loggers to erosion, streamflow and ecological considerations; similarly to legally established reserve forest areas.

The consequences of land degradation and inappropriate land use practices have the potential to impact negatively on the tourist industry. Sectors of the industry already express concern about dirty rivers, frequency of flooding, water rationing and poor quality water, unsightly landscapes, pollution and visible waste. Environmentalists' point to the vulnerability of the coral reefs to excessive sediment brought into the lagoons by flooded rivers from eroding watersheds.

Ecologists have concerns over the forest hardwood programme. These relate to the vigour of mahogany that potentially could lead to a monoculture and elsewhere, invasion of native forests. Also, as mahogany plantings often follow logging, a high proportion of Fiji's native production forest is being lost. Planting of mahogany on steep slopes and riparian zones (which is illegal) poses a potential erosion risk at logging time.

#### *3.2.9 Inappropriate land use in the coastal margins*

Large-scale reclamation of mangroves for rice production in particular has proven to be economically unviable with significant net financial losses (refer P. Lal's Raviravi analysis). This national loss is in addition to the loss of benefits for subsistence villagers from mangrove removal.

Coastal zones is of vital importance and it brings together an unique assemblage of resources such as mangrove, water, agriculture, seafood and high quality landscapes. It is also the location of significant towns and villages, with majority of population and industry build up . It is ecologically complex and sensitive and highly susceptible to natural hazards and human violations.

#### *3.2.10 Information*

There is a very poor public understanding in the rural sector about various legislation that pertains to land, land use practice and soil conservation. This situation results in part from the fact that the majority of government and corporate (e.g. NLTB, FSC) field officers responsible are themselves not conversant with the various laws. Also, there have been no public awareness programmes to inform about the land husbandry provisions stated in these laws and written into rural leases. For 30 years, there has been in essence no enforcement or policing of these provisions; in effect, a whole generation has been kept in the dark since land conservation laws were regarded seriously and enforced.

The level and standards of technology transfer from officials to farmers is inadequate on matters of land use diversification and intensification, farming systems and their development needs, new systems, costs of inputs and gross margins, post-harvest support and marketing.

Soil conservation legislation is not being used due to poor understanding of the issues at both planning and implementation levels. Resources devoted to soil conservation are inadequate for applying significant measures either for information or incentives. The LCB does not have available information and publicity material for land users/farmers about soil and water conservation and land management.

There is a lack of clear guidelines on what constitutes ‘bad’ land husbandry practices, and poor institutional understanding about the magnitude of the soil erosion problem. There is also very little literature about land use farming practices available in Fiji Hindi or Fijian.

### 3.2.11 Land Tenure

The availability of land resources for agriculture and other commercial activities is an important ingredient for the socio-economic development and diversification of the economic base of a country. The total land area of Fiji is 18,299sq km ( refer to Table1) comprising of the following; native land for those lands owned by traditional land owning units which may be mataqali, tokatoka or yavusa; Rotuman communal land State land or formerly crown and freehold land.

**Table 1 Types of Land Tenure ( Ownership) in Fiji**

Tenure Type	Areas	Percent of Total Area
State Land	31,195.0 hectares	1.70
Freehold Land	147,448.0 hectares	8.06
Native Land	1,646,814.0 hectares	90.0
Rotuman Communal Land	4,452.0hectares	0.24
Total	1,829,909.0 hectares	100%

The land tenure system and lease issued under the native and crown land through the Agriculture Landlord’s Tenants Act is not conducive to the sustainable land resources management, where the lesee tend to mine the land for economic gains, knowing very well that the lease will expire after 30 years of occupation. Therefore resulting in high degree of land degradation.

A total of 13,141 lease will expire by 2028 and some will be renewed to sitting tenants and the rest will be occupied by the landowners and new tenants. But this leasing arrangements needs to reviewed to take into consideration the need to extend the length of the tenancy. This will give the tenants confidence to invest on the sustainable development and management of the land to sustain crop production and other forms of land use.

### 3.2.12 Poverty

Poverty can be seen in all communities. Although the impact of poverty is offset by the relatively high level of subsistence and food security, 25 per cent of the populations are living below the poverty line. This proportion has probably increased as a result of the impact on land use from the recent droughts and subsequent floods. Clearly rural incomes have been

reduced (both for farmers and those on wages) and greater rural unemployment exists as a result of these climatic events. Rural poverty is greatest among those farming degraded and/or marginal land for agriculture and among those without access to the land. The significant increase in rural-to-urban migration has reduced the food security buffer and traditional (rural) family support mechanisms.

Rural youth constitute a major part of the less educated school leavers (without FSLC) and are a significant element in the rural-to-urban migration due in part to the lack of employment in the rural sector. No significant Government schemes are available to create rural employment and stimulate income-generating opportunities.

### *3.2.13 Poor local control, responsibility and incentive because of central government control*

Currently there is an over-centralisation in planning and current legislation does not allow for segregation of national, divisional and local issues. Desirable outcomes from national, divisional and local land use and rural sector development objectives cannot be realised without the following mechanisms:

- ‘Bottom–up’ planning;
- A change in the current national centralisation of control;
- Introduction of legislation that segregates national, divisional and local issues;
- Integration of land capability and community needs; and
- The absence of law and processes for co-ordination of watershed management, land zoning, land use planning and sustainable natural resource management.

A major limitation to sustainable rural development in Fiji is the lack of an integrated National Land Use Plan and an institutional responsibility for the land use planning to facilitate the national plan. Land resources are limited and finite. If the demographic trends continue, there is an increasingly urgent need to match land systems, soil types and land uses in the most national way possible, to maximise sustainable production and meet the needs of society. Land use planning is fundamental to this process.

As it relates to rural land use, the present legal and administrative system comprises a number of old laws that have not been significantly amended (although largely still relevant). However in general these are not enforced or policed and compliance is voluntary or coerced. There is no overriding planning provision that enables integration of land capability assessment and community needs for sound land use and planning.

Deficiencies in physical planning are being compounded by significant rural-to-urban drift that has resulted in widespread development in the peri-urban areas. It is a weakness in the physical planning sense that TCPD has not been given the mandate to develop regional and district schemes in collaboration with appropriate bodies and agencies of government. Combined with zoning, these plans would go a long way towards controlling indiscriminate and inappropriate land use, particularly in the peri-urban areas. Without such schemes, urban areas do not have a framework in which to indicate their growth and development directions. Significant tracts of first-class soils for food production are being lost to urban use, e.g. Nadi to Lautoka corridor (only 16% of land area available). No mechanism exists to resolve land use conflicts.

The National Development Plans (DP6 – DP9) provide adequate environmental policy but have been weak in the implementation of strategies and programs. This can be attributed to: a lack of integration of development and environmental policies; environment provisions which are spread among a number of Acts; and the predominance of national economic and social development objectives that are invariably isolated from any environmental framework.

There is in general an inability by the Government of Fiji to manage natural resources on a sustainable basis due to inadequate policies, legislation, forward planning and administration. No one government department is responsible for the planning and co-ordination of watershed management

#### **4.0 Drought Mitigation and Early Warning System Management**

##### 4.1 National Framework for Risk Management and Disaster Management

The establishment of the National Disaster Management Office in 1991 by government was based on the International Decade for Natural Disaster Reduction (IDNDR) framework of action, and the International Strategy for Disaster Reduction. The operations of the NDMO emphasizes the shift in paradigm of disaster management in Fiji from that of reactive in nature during emergencies to that of a holistic approach.

#### **5.0 Past and Current Initiatives**

##### 5.1 Initiatives for Sustainable Land Management

###### *5.1.1 National Strategic Development Plan*

As a developing nation with a global economy, Fiji, needs to set a clear sustainable path for its development into the future. Therefore after the political distraction of May, 2000, an Interim Government was established and later a Caretaker Government were given a mandate to rebuild confidence and introduce measures for the sustainable economic recovery and for medium term growth.

After the General Election of September, 2001 the elected Government continued to build on the plat form set by Interim and Caretaker Governments but to also consider the long term strategies in the process. The outcome of which is the formulation and implementation of the National Strategic Development Plan for 2002 to 2004.

The NSD Plan sets the stage for the future investments in infrastructure, capacity building and resources management which needs to be in place to take advantage of the opportunities while improving quality of life and avoiding degradation of the environment over the long term.

The Plan is a manifestation of policies and strategies assembled together by the Government through participatory dialogue and consultations with relevant private sectors and civil societies in the country. Providing a holistic approach on the key economic, social,

environment and political fundamentals that are required by any Government to safeguard and promote.

The policies to achieve government's medium term goals covers eight (8) focal areas and they are as follows;

- Macro- economic stability
- Good governance
- Competitive domestic markets
- Engaging the global Economy
- Efficient and Effective Public Sector
- Education and health
- Affirmative Action for the disadvantaged
- Government and Civil Society partnership
- Policy Implementation

Although concerted efforts are needed to implement policies in all eight focal areas of the policy but the key development issues which requires special attention, are as follows;

- Advancement of Indigenous Fijians and Rotumans in commerce and business
- Population and labor market
- Poverty alleviation
- Telecommunication and Information Technology
- Land Resources Development and Management

Sector policies and its strategies must be aligned with the national goals and must be based on government's underlying philosophy that it is the private sector that is the engine of growth. The integration of these sector policies and its strategies during implementation will produce synergies which compliments the principles of the United Nation Convention to Combat Desertification. The sectors are as follows:

- Sustainable Use of Natural Resources
  - ✓ Sugar: The sustainable development and management of the sugar industry to optimise benefits for private sector investment, resources owners and community.
  - ✓ Agriculture: Encouraging the private sector to develop is critical for the sustainable development of agriculture.
  - ✓ Forestry: Fiji is a member of the International Tropical Timber Organisation, committing Fiji totally to sustainable management and development of exotic and indigenous tropical forests with the certification of tropical timber for trading.

- ✓ Marine Resources: The sustainable development and management of marine resources to optimise benefits for private sector, resources owners and community.
  - ✓ Mineral Resources: The sustainable development and management of mineral resources to optimise benefits for private sector, resources owners and community.
- Human Resources-based industries
  - ✓ Tourism
  - ✓ Manufacturing
  - ✓ Science and technology
- Physical Infrastructure
  - ✓ Transport
  - ✓ Water and Sewerage
  - ✓ Energy
- Equitable Development and Quality of Life
  - ✓ Health
  - ✓ Education and Training
  - ✓ Housing and Urban Development
  - ✓ Rural Development
  - ✓ Environment
  - ✓ Culture and Heritage
  - ✓ Gender and Development
  - ✓ Disaster Management and Mitigation
  - ✓ Youth and Development
  - ✓ Sports Development
  - ✓ Protection of Children
  - ✓ Law and Order
- Foreign Relations and External Trade
  - ✓ External Relation

✓ Trade and Economic Arrangement

- Monitoring and Evaluation.

5.2 National Plans or Strategies in the Field Of Land Degradation

5.2.1 *Watershed Management Master Plan*

In August, 1996 the Japanese International Cooperation Agency (JICA) began a two year study on the watershed management and flood control for the four major river system namely; the Rewa, Ba, Nadi and the Sigatoka rivers. The study was carried out in order to formulate the basis of a Master Plan for the Watershed Management and Flood Control for all the major river system in Fiji. The study ended in October, 1998 with a coherent Watershed Master Plan for the country.

5.2.2 *National Natural Disaster Management Plan*

The 300 islands of Fiji, of which 100 are inhabited, are susceptible to variety of natural hazards such as the tropical cyclones, floods, storm surges, landslide, drought, earthquakes, tsunami and forest fires. In recognizing the need, the Government of Fiji (GOF) formulated a National Plan for Natural Disaster Management under the Natural Disaster Management Act of 1998. The plan seeks to strengthen coordination, collaboration and resources mobilisation amongst stakeholders in the prevention, mitigation and handling of natural disasters.

Supporting the operating system for disaster management are various other institutions, services, and mechanisms. These includes the Earthquake Seismology Section of the Mineral Resources Department responsible for monitoring earthquakes in Fiji and the South Pacific; the Meteorological Service within which is the Regional Specialised Meteorological Center for the South Pacific; the National Building Code to reduce vulnerability to cyclones and earthquake shocks and extensive Non Government Agencies resources such as the Red Cross, Foundation of the People of the South Pacific, Fiji Council of Social Services, Salvation Army, Save the Children Fund, churches and others with international partners such as the Food and Agriculture Organisation of the United Nations which had supported financially with US \$45,000.00. to the Strengthening of the National Capacity for Emergency Disaster Preparedness and Mitigation in Agriculture Project.

5.2.3 *Climate Change Vulnerability and Adaptation Assessment and Strategic Plan.*

Fiji is a signatory to the UN Framework on Climate Change therefore it is obliged to provide a National Communication document that includes information on climate change vulnerability and adaptation implementation policies and strategies. These requirements were supported by the Pacific Islands Climate Change Assistance Program(PICCAP) based with the South Pacific Environmental Regional Program, Apia, Samoa.

The National Focal Point ( NFP) for the UNFCC program is the Department of Environment, thus a Climate Change Vulnerability and Adaptation Assessment for Fiji was carried out using Viti Levu as a case study in 1999, based on the soils of Viti Levu information supplied by the Land Use Section of MASLR. The study was a multi- stakeholder effort which involves government, non-government, civil societies resources users and owners who

provides data on the implications of climate change on four sectors: agriculture, coastal resources, human health and water resources.

The anticipated impacts of climate change and sea level rise on the coast of Viti Levu includes; shoreline erosion, increased storm damage and flooding, salinity intrusion into rivers, disappearance of wetlands and possible reef destruction due to increased sea surface temperatures.

The adaptation strategies identified include;

- ✓ improved understanding of the coastal dynamics through data collection exercise and monitoring programs. Structural or bio-engineered coastal protection projects inquire site specific data and analysis before being considered
- ✓ examination of coastal protection options for reducing erosion risk
- ✓ land use planning
- ✓ protection of mangrove and reefs which are natural protection system
- ✓ adequate pollution control, to prevent reef die-off
- ✓ use of setbacks from shoreline and low lying areas in the construction of buildings and
- ✓ mangrove replanting in degraded areas.

#### *5.2.4 National Biodiversity Strategy and Action Plan (NBSAP)*

The FBSAP was prepared through the Department of Environment which is also the National Focal Point for the United Nation Convention for Bio- Diversity in 1999. After consultation with different stakeholders at different levels from local to national, a strategy was formulated on conserving the genetic, species and ecosystem diversity of the country. It focuses on six focal areas;

- ✓ community support-awareness, involvement and ownership
- ✓ improving knowledge
- ✓ developing protected areas
- ✓ species conservation
- ✓ control of invasive species and
- ✓ capacity building and strengthening

The strategy observes that Fiji has only a rudimentary system of protected areas and that it is time to create "site of national significance program" that would provide legal protection and establish management plans. It also identifies institutional and capacity building as a very vital aspect of the commitment.

### *5.2.5 Mangrove Management Plan*

In 1985, a Mangrove Management Plan for Fiji was formulated. It contains a characterisation, policies and maps of the mangrove location, types and use zones for the main islands of Viti Levu, Vanua Levu, Ovalau, Gau and Kadavu.

This document is still being used for decision- making purposes on foreshore reclamation of mangrove by the Department of Land and Surveys

### *5.2.6 Fiji Tourism Development Plan (FTDP)*

The Fiji Tourism Development Plan (FTDP) 1998-2005 was formulated by a multi stakeholder group including the Ministry of Tourism, the Tourism Council of the South Pacific and other government and non government agencies. The plan is an indication of the commitment of the tourism sector towards sustainable development.

The FTDP also identifies weaknesses and hindrances to the tourism industry as well as opportunities for improving tourism in the country and the actions that should be taken. But a whole section of the plan is assigned to conservation and environment protection due to the industry being closely linked to the natural environment. The plan for this section includes;

- ✓ The proper disposal of sewage to protect coastal waters.
- ✓ The introduction of a Green Code that would encourage the improvement of environmental standards of tourism operators and provide a marketing bonus to those resorts that subscribe to it. The Green Code would aim to avoid waste, promote proper waste disposal methods and the conservation of water and energy.
- ✓ Review the carrying capacity of small island resort.
- ✓ Strict enforcement of planning procedure for hotel and resorts.
- ✓ The need for Environment and Social Impact Assessment for developments.
- ✓ Public Awareness campaigns creating awareness of the fragility of the coastal areas.
- ✓ Integrated Coastal Management so that cross- sectoral issues can be addressed.
- ✓ The establishment of marine parks that tourist could access

The Ministry has also developed the Eco-tourism and Village Based Tourism Policy and Strategy for Fiji which provides the platform for the development of small and medium tourist enterprises by indigenous Fijians. The policy and strategies emphasis promotion of environmentally friendly forms of tourism and the importance of integrated planning at village level.

### *5.2.7 Environment Management Act of 2005.*

The Department of Environment coordinated the development of a multi sectoral Act which was completed in 1996, however it has been extensively reviewed and reworked. The current

strategy is to enact the less controversial components first and these have been combined and under final review.

Even though the entire Act is still far from adoption, most national administrative departments and experts use this as the *de facto* environmental management framework for Fiji. Among the main provisions of the proposal which are of particular importance to land resources management, the Bill calls for the establishment of a National Council for Sustainable Development and the establishment of the National Resources Management Plan with the creation of 13 policy statement of which six (6) are interrelated to the principles of the UNCCD, UNCBD and UNFCCC. The policies are as follows;

- ✓ Sustainable Coastal Management Policy
- ✓ Sustainable Mineral Resources Development Policy
- ✓ Sustainable Forestry Development Policy
- ✓ Sustainable Agricultural Development Policy
- ✓ National Biodiversity, Conservation and Protected Area Policy and
- ✓ Sustainable Resources Management of Native and State Land.

The Act proposes that each ministry will be required to create its own environment management unit to formulate the policy statement, have a natural resources inventory and resources management plan for the resources under their jurisdiction as well as conducting internal environment audits.

The Act requires Environmental Impact Assessments for any development proposals which is likely to cause significant environmental or resources management impact. It also requires commercial or industry facility that is likely to discharge pollutants into the environment to be abided with a Code of Environmental Practice.

The Bill if enacted will be an omnibus legislation which will compliment and stream line the various environment legislation and institutional structures to be more efficient and effective towards the sustainable development of Fiji's natural resources.

#### *5.2.8 National Rural Land Use Policy and Plan*

Fiji does not have an integrated rural land use policy or a national land use plan. This is a major constraint to wise allocation and management of resources in the rural sector and is of critical importance as it covers all land based resources such as forest, agriculture, minerals, rivers and streams. The current administrative and institutional framework responsible for the resources allocation and management is highly sectoralised.

In November, 1998 a review on the rural land use in Fiji began with the assistance of the South Pacific Community/ Pacific German (GTZ) Forestry/Agroforestry Program. This resulted in the formulation of a coherent set of National Rural Land Use Policies which had been documented and endorsed by government. The National Rural Land Use Policies are as follows;

- Increased public awareness that; the land resources, including soil, water and flora are interdependent and must be managed in an integrated way, and individual users and community have responsibility for preventing and mitigating land degradation.
- Increased public recognition of the values of trees and forests
- A regulatory framework for the protection and sustainable development and management of rural land resources that recognises;
  - ✓ Sound land husbandry practices to maintain and improve soil qualities,
  - ✓ Planning process address causes of land degradation as well as symptoms,
  - ✓ Indigenous forests will be protected and managed for their biodiversity and conservation values,
  - ✓ Plantation forests both hardwoods and pine, will be considered in terms of sustaining site quality and
  - ✓ Protection of the environmental and management of natural resources is carried out in an appropriate and ecologically sustainable manner.
- Appropriate mechanisms to protect farmlands and forests from fires, pest and pathogens.
- Research, training and education to;
  - ✓ improve land assessment an evaluation
  - ✓ land husbandry practices
  - ✓ farm and forest productivity and values and
  - ✓ land use planning.
- Institutional reform to support and enhance capabilities in all rural sector activities.
- Protection of water and soil values.
- Good governance strategies to expand and diversify sustainable economic activity, increase employment, add value to earnings and promote social development goals.
- An effective Fiji involvement with and contribution to global issues and laws related to the environment, rural development, sustainable land management etc...

The adoption of a rural land use policy that incorporates multiple-use between agriculture, forestry, tourism, biodiversity conservation, urbanisation etc. that can avoid planning conflicts and act as a standard as well as a guide on which to make more effective decisions on the sustainable development and management of land resources. A sound rural land use policy should manage land for sustainable uses, balance production with protection, create diversity and will leave an enhanced heritage for future generations.

The National Rural Land Use Policy document was endorsed by Cabinet on the 22<sup>nd</sup> of June, 2005. This policy document will be used as the guide for the formulation of the National Rural Land Use Plan or National Land Use Plan.

### 5.3 Scientific and Technical Land Degradation Control Activities

Fiji has been involved with several scientific and technical activities or initiatives which would compliment the NAP when it is implemented. The programs and projects have different levels of success due mainly to various factors such as; unsustainability of funding, individualistic type of implementation (need to be holistic to be sustainable) and others

The activities and initiatives are as follows;

#### 5.3.1 *Soil Surveys and Soil Correlation Program*

The program was carried out from 1981 to 2001 where the National Soils Surveys was completed by 1985 and the soils were classified according to the International Soil Taxonomy based on the USDA system which is currently being used as the international standards as the primary system with soil series. These has also being correlated to Fiji National Soil Classification System which locally known as Twyford and Wright (1965).

After the soil surveys, the soil mapping exercise for Viti Levu, Vanua Levu, Taveuni, and several islands in the Lau Group were carried out and completed at the scale of 1: 50,000. This information will be the basis for agro-technology transfer of research and scientific data based on soil types regionally, sub-regionally or nationally, identification of soil types or series and its chemical components for fertiliser recommendation purposes, the land use capability classification and crop suitability assessment for the nation, where the matching of land use/ crop types and land capability is very important if productivity and sustainable land management goals are to be met.

#### 5.3.2 *Soil and Crop Evaluation Project.*

The Soil and Crop Evaluation Project was a five year project that had been jointly funded by Fiji, New Zealand and Australia. It began in June, 1993 with an overall objective to contribute to self sufficiency in Fiji of food crops, and an increase in export earnings by definition and demonstration of crop nutrient requirements on the soil suitable for sustainable cropping systems in Fiji.

To achieve its overall objectives the project had five sub-objectives, which were as follows;

- ✓ To strengthen the capability of the Research Division to undertake appropriate farmer oriented research.
- ✓ To provide skills necessary for the Research Division and Extension Division of MAFF personnel to be better able to carry out their work.
- ✓ To undertake scientifically rigorous, high quality agronomic research which responds to the need of the farmer.
- ✓ To transfer appropriate technology from the research to the farmer by the most appropriate means.

- ✓ To assist in the development of the MAFF Geographical Information Systems.
- ✓ To direct and report on the Project to assure the achievement of the project goals.

The project ended in June, 1998 with varying degrees of success on its five sub-objectives and its overall objective.

### *5.3.3 Geographical Information Systems*

In 1994 with the assistance of the AUSAID of Australia, the NZODA of New Zealand and the Fiji Government through the Soil and Crop Evaluation Project established the MAFF Geographical Information Systems and it was housed under the Land Use Planning Section of the Research Division and now of the Department of Land Resources Planning and Development. To date the Land Use Section have digitised and have stored the database of Taveuni Island and the two main island of Viti Levu and Vanua Levu and several small islands in the Lau Group.

The Land Use Section have also imported information such as the cadastral mapping systems, roads, river systems, native land mapping systems, forest inventory, geological information and other information from data custodians such as the Native Land Trust Board, Forestry Dept. Fiji Land Information Systems and others. These stored database is retrieved, manipulated and analysed for different outputs according to the needs of the clients, to make informed quality decision for the sustainable uses of their resources.

### *5.3.4 Participatory District / Tikina Based Land Use Plan:*

In late 1999 the Land Use Section of the Research Division and later of DLRPD took the initiative to establish a participatory land use planning approach as a pilot project in the Bemana District in the province of Nadroga, in collaboration with the Extension Division of MASLR, Native Land Trust Board, Ministry of Fijian Affairs, Ministry of Fisheries and Forests, civil societies such as the WWF and the Foundation of the People of the South Pacific (USP), resources owners and other stakeholders

This would be the basis of future integrated or holistic approach to land resources planning, development and management programs. It emphasis the importance of a bottom up approach to land use planning and one of its main objective is to establish local land care groups, to empower communities to efficiently and effectively develop and manage their resources and create land stewardship amongst the resources owners and users.

### *5.3.5 Integrated Agriculture Development Program:*

In early 2001 the integrated agriculture development program was endorsed by MASLR and carried out as a pilot project with assistance from Regional Development, Cooperative Dept, Health Dept., Native Land Trust Board, Fijian Affairs Board, Environment Dept. and other stakeholders focusing on bottom up or participatory approach to land development and management.

A pilot project was carried out in the District/Tikina of Toga in the Province of Rewa, Central Division. The program was initiated by the MASLR and fully supported by the

Commissioner Central who is the head of administration in the Division, thus the formation of the Central Division Integrated Development Team (CDIDT).

The members of the CDIDT are from the various government and non- government agencies in the Division, who shared the view that agricultural development needs to be planned, implemented and monitored in an integrated or multi-sectoral way. This is to ensure a more balanced approach to development as well as optimal using of available resources through the mobilising of both human and financial resources to be able to accomplish community development projects within the Division.

#### *5.3.6 Soil Loss Research and Development of Sustainable Land Management Technologies:*

The International Board for Soil Research and Management (IBSRAM)/ Pacificland Network Program was established in 1991 to assist in the soil loss research as well as to develop and disseminate appropriate technologies for their sloping agricultural lands. The program was initially funded by the Asian Development Bank and in the later years by AusAid. It ended in December, 1999, but continued with internal funding from the Fiji government.

The program is a joint effort between the Department of Land Resources Planning and Development, Extension and Research Division of MASLR, resources owners and users. The technologies identified were being assessed against the farmer's current practice, it includes vetiver grass strips, pineapple hedgerows and other crops such as kava or leguminous tree species, that were selected collaboratively by the researchers and farmers. For example soil loss rate on a ginger plot where no conservation is practiced yielded more than 50 tons per hectare per year compared to the soil loss index in the tropics of 13.5 ton per hectare per year. But in the ginger plot where the low cost sustainable land management technologies such as vetiver grass as hedge rows were practiced it yielded less than one(1) ton per hectare per year of soil loss.

#### *5.3.7 Agroforestry Program:*

The Fiji/German Project supported agroforestry in Fiji under the German bilateral program from 1987-1994. The project focuses on the agroforestry practice with alley cropping and moved to regional multi-lateral program in 1995. The Agroforestry project was established within the MAFFA's Extension Division and then transferred to the Land Use Section of the Research Division and now of Department of Land Resources Planning and Development (DLRPD) in February, 1997 to assist clients to adopt the advocated agroforestry practices.

Regional organizations such as the German Technical Corporation (GTZ) and the Pacific Regional Agriculture Program (PRAP) assisted DLRPD on agroforestry research. The research on *Erythrina subumbrans (Drala)* and *calliandra* leguminous tree variety as a soil fertility improvement species was tested out on acid soils of the uplands of Fiji. Other research activities includes the surveys of traditional agroforestry practices in Fiji, of which information was gathered and documented to assist the DLRPD provide a range of technologies that could be adapted to meet the conservation and economic needs of the people.

The focus of the SPC/ GTZ Regional Program is Sustainable Forestry Management and Sustainable Land Management and it had assisted Fiji in the formulation of its National Rural

Land Use Policy which will be used as a guide for the formulation and implementation of a National Land Use Plan for the sustainable development and management of Fiji's land and water resources.

#### *5.3.8 Pacific Regional Agriculture Program*

In 1993 the PRAP/ European Union Project 1- for Farming System in low lands assisted the Land Use Section of Research Division and now of DLRPD with the agroforestry research by using *Erythrina subumbrans* as a fertility improvement species in collaboration with the SPC/GTZ Regional Forestry and Agroforestry Program. The research was carried out on acidic upland soils. The program also collated information on traditional agroforestry practices in Fiji.

One of the important contributions of the PRAP Project was the capacity building aspect of mainstreaming Participatory Rural Appraisal (PRA) into the agricultural program. PRA is a practical approach to creating a context where local people or communities can identify, discuss and solve their own problems. The involvement of communities or land users or resources owners from the planning to the implementation of the projects is very important if the projects are to be sustainable. Therefore the people's participation is crucial and this empowers them to make good informed decision on the balancing of resources development and conservation.

#### *5.3.9 Awareness and Training on Sustainable Land Management:*

The Land Use Section of LRPD, the Research and Extension Division of MAFF/MASLR, other Ministries, NGOs and civil society such as the Foundation of the People of the South Pacific, University of the South Pacific, WWF and others have jointly carried out awareness and training on land degradation, disseminating information on sustainable development and transferring of low cost sustainable land management technologies for sloping land farmers as well as for the school children and other stakeholders. The long-term vision is to set up land husbandry/care groups in various communities in Fiji to empower communities to oversee the sustainable development and management of their natural resources.

#### *5.3.10 Transfer of Sustainable Land Management Technologies (SLMT):*

In 1997 when the Commodity Development Framework program was implemented, the result of the IBSRAM/ Pacificland and Agroforestry on farm research program were transferred to farmers field throughout the Central, Eastern, Western and Northern Division of Fiji. Recognizing the effectiveness of vetiver grass, pineapple with the inclusion of leguminous and nitrogen-fixing tree species such as calliandra, erythrina and gliricidia on contours to act as living barriers, nutrient pumps as well as hedgerows. This program is similar to the Sloping Agriculture Land Technology ( SALT) Program implemented in the Asian countries. Altogether 300 farmers have adopted the low cost sustainable land management technologies all over Fiji and more have been waiting for technical assistance.

The program needs the support of donor partners to assist in the dissemination and implementation of the SLMT program to reduce or minimise land degradation.

### *5.3.11 Drought Mitigation*

In 1998, Fiji experienced the worst drought since rainfall records began in 1942, it recorded low rainfall than usual in October to April wet season. Damages to agricultural crops was estimated at US\$10 million. Food and Agriculture Organisation assisted with planting material and inputs while the Government of Finland supported the drought mitigation and preparedness training and awareness program. The government of Fiji assisted the sugar cane farmers by providing US\$ 21 Million for crop rehabilitation program.

### *5.3.12 Climate Change and Variability Scenario Generation/Modeling:*

Climate change is likely to have a substantial and widespread impacts in the Pacific Island Countries, including the Fiji Group, affecting sectors as varied as health, coastal infrastructure, water resources, agriculture, forestry and fisheries. In August, 1999 the South Pacific Regional Environment Program (SPREP) with the assistance of the International Global Change Institute (IGCI) ( Waikato University, New Zealand ) produced a climate change computer modeling program known as the PACCLIM( Pacific Island Climate Change) proto-type model. The computer modeling is used to create scenarios to predict climate change and sea level rise in the Pacific.

IGCI, SPREP and the World Bank funded the creation of the FIJICLIM an offshoot of the PACCLIM, a computer modeling scenario generator to be used to predict climate changes and sea level rise in Fiji. But the modeling still needs to be further developed for Fiji to have any significant contribution to climate change mitigation.

### *5.3.13 Land Use Options in the Fiji Sugar Industry:*

In light of the ongoing international trade reforms, Fiji faces major challenges as it addresses its obligation under the World Trade Organisation. The challenges are particularly acute in the face of current reforms in the European Union and USA agricultural sector and the expected loss of the preferential access for the Fiji sugar to these markets.

The AUSAID through the Australian Center for International Agricultural Research (ACIAR) funded a project beginning in January, 1999, with an overall goal to assist Fiji Government, the Fiji Sugar Industry and most importantly the small holder sugar cane farmers to better adjust to expected reduction and eventually loss in the preferential access to EU and USA markets. It also needs to prepare itself to compete with other sugar exporting countries in the world market.

Therefore the assessment of land currently under cane should be carried out to identify land most suitable for sustainable cane production and land unsuitable for cane but suitable for other land uses such as for crop diversification on crops such as pineapple, mangoes, pawpaw, pigeon peas, floriculture, livestock grazing, forestry and other uses. In other words, using the land according to its capability for sustainable production.

This is also a strategy to encourage the Fiji Sugar Industry to improve its economic, social and environmental performance through voluntary initiatives, taking into account initiatives such as that is set by the International Organisation for the Standardisation (ISO) standards.

The program was selved during the political impasse of May, 2000 but the program has resumed with low intensity.

#### *5.3.14 Land Capability Classification:*

In 1977 the Fiji Ministry of Agriculture Fisheries and Forest adopted a Land Use Capability Classification Guideline which was adopted from the New Zealand version of the USDA Land Use Capability Guideline. Land use capability classification surveys are carried out by the Land Use Section, DLRPD for feasibility studies on land resources, to assess the capability of that land to sustain production for different uses.

Land use capability is a systematic arrangement of the different kinds of lands according to those properties that determine its capacity for permanent sustained production. The word "capability" is used in the sense of " suitability for productive use" after taking into account the physical limitations the land may have.

This capacity depends largely on the physical qualities of the soil and the environment, these are frequently far from ideal, and the difference between the ideal and the actual is regarded as limitations imposed by these soil qualities and the environment.

These limitations affect the productivity of the land, the number and complexity of corrective practices needed and the type and intensity of the land use. The degree of limitations can be assessed from (a) susceptibility to erosion,(b) steepness of slope, (c) liability to flooding, wetness, or drought, (d) salinity,(e) depth of soil, (f) soil texture, structure and fertility,( g) stoniness, and (h) climate.

#### *5.3.15 Development of integrated farming approaches for sustainable crop production in environmentally- constrained systems in the Pacific region (CROPPRO Project).*

In November, 2001 the European Community CROPPRO three years funded project was launched in Suva, Fiji, with an overall objective to develop an integrated farming approaches for sustainable crop production in environmentally constrained systems in the South Pacific region, aiming at increasing crop productivity and decreasing land degradation. To address the project objective, seven sub-objectives have been identified as follows;

- i) selection of representative agriculture watersheds and subsequent land inventory,
- ii) execution of a farming system analysis to investigate current farming practices for major crop types,
- iii) monitoring of water, soil, nutrient and pesticide flows within the watersheds,
- iv) simulation of water, sediment and solute flows using a catchment-based, soil erosion and hydrological model, and identification of high loss ( low sustainability) areas in the watersheds,
- v) definition, testing and evaluation of prospective farming practices for these areas,
- vi) preparation of guidelines with integrated farming approaches for major soil units, and

- vii) establishment of close links between researchers and end users through the use of a participatory and culture sensitive training strategy for the various community groups living and/or working in the project areas

The research program is being carried out in three Pacific Island Countries namely Samoa, Tonga and Fiji. The Fiji component is being managed by the Department of Land Resources Planning and Development in collaboration with Eco-consultant (Fiji), MAF (Tonga), University of the South Pacific, Alafua Campus, Samoa and METI, Samoa, Alterra Green World Research Institute, the Netherlands, Hort-Research (NZ) and University of Louvain-Belgium.

#### *5.3.16 Integration of Sustainable Land Management (SLM) and Sustainable Forestry Management (SFM)*

In early 2000 The SPC/GTZ Regional Project for Forestry and Agroforestry in collaboration with the Department of Land Resources Planning and Development (MASLR) and the Forestry Department of Ministry of Fisheries and Forests (MFF) have integrated the sustainable land management (SLM) and the sustainable forestry management( SFM) technologies as a pilot project, in collaboration with the Extension Division of MASLR, Cooperative Department, Fijian Affairs Board(FAB), Native Land Trust Board(NLTB), Fiji Forest Industry (FFI), land owners and other stakeholders, by using Drawa Block, an area that consists of five (5) villages and covers more than 8,500 hectares of virgin forest in Vanua Levu(second largest island in Fiji).

The project has assisted in the formation of a Landowners Committee and a SFM/SLM Working Committee. The members comprises of senior members from; NLTB, FAB, MASLR, Forestry Depart., Cooperative Dept. FFI including the Chairman of the Landowners Committee. The Landowners Committee has begun with the advocacy for the formation of Land Care groups within the project area.

The synergies derived from combining the sustainable land management and sustainable forestry management initiatives augers very well with the idea of integrating the United Nation Convention to Combat Desertification/Land Degradation, United Nation Convention for Bio-Diversity and the United Nation Framework for Climate Change principles.

#### *5.3.17 Integrated Coastal Resources Management*

The Institute of Applied Science (IAS) of the University of the South Pacific based in Fiji, the University of Rhode Island Coastal Resources Center, USA and the Government of Fiji are working in partnership and have initiated a program known as the Integrated Coastal Management for Fiji which was launched after a National Workshop held in April, 2002.

The coastal areas are of vital importance to Fiji society and its national development. Most the urban centers and vast majority of villages are located on the shore, along with much of the population, agriculture, industry and commerce. Therefore as result of population increase, rapid coastal development and increasing utilisation of coastal resources these has resulted in various impacts on the coastal environment which includes; loss of habitat and biodiversity, inappropriate solid waste management, mismanagement of chemical wastes, pollution of air and water ways, land degradation etc.

The initiative includes the involvement of all government ministries such as the Ministry of National Planning, Ministry of Agriculture, Sugar and Land Resettlement, Ministries of Fisheries and Forests, Ministry of Fijian Affairs, Ministry of Lands and Mineral Resources, Ministry of Works and Energy, the Non Government Agencies like the Native Land Trust Board, National Trust, Ports Authority of Fiji, Civil Societies such as the World Wild Fund for Nature (WWF), Foundation of the People of the South Pacific ( FSP), University of the South Pacific( USP), resources owners and users. The programs have also identified the Coral Coast of Fiji as is pilot project area.

#### *5.3.18 Development of Sustainable Agriculture Project.*

Development of Sustainable Agriculture (DSAP) is a regional project being implemented in 10 Pacific Island Countries. The project is funded by the European Union and its main purpose is to increase sustainable agricultural production on farm families in participating countries. The main strategy for achieving this emphasis is the dissemination of technologies based on the farmer livelihood needs and building national institutional capacity in the use of participatory approaches in sustainable agriculture development.

The key target outputs are as follows;

- Improved systems to identify farmers production problems and solutions
- Appropriate technologies identified.
- Participatory extensional skills upgraded for National Research and Extension staff
- Appropriate technologies scaled up and promoted.
- Enhanced capabilities in extension communications.

#### *5.3.19 Development of Landcare Groups*

The successful implementation of the National Rural Land Use Policy and Plan depends very much on a delivery framework that combines top down and bottom up approach to facilitate communication between communities and government agencies. There is a need for a coordinating mechanism whereby government programs are complemented and strengthened by activities of the groups of stakeholder at community level.

At community levels resources owners and users need to be organized and empowered to plan and manage their resources, in order to provide the bottom up input necessary in the interactive resources management. A mechanism to facilitate this, is through the group based concept where the resources owners and users are organized into local resources management groups, widely known internationally as the Landcare Groups.

The Landcare Concept is based on participatory community development approach. Experience has shown that technology alone has not improved the management of natural resources. The emphasis has therefore been placed on institutional strengthening, local decision making and building the self reliance of the local communities.

Fiji is fortunate that it has a social structure which embrace and enhance the formation of such a movement at settlement, village, district and provincial basis. But for the resources users such as the lease holders, they need a lot of awareness and education to strengthen their participation and supportive role. The need to integrate and work together as a team for the benefit of the country is quite imminent.

After two very successful workshop on “Landcare in Fiji” themed, “Strengthened partnerships for the sustainable management of land resources,” where it was aimed at addressing a long standing concern within government structure, which is the lack of coordination between government agencies, and in this particular case, agencies operating in the land utilization and development arena. There is also poor communication and collaboration between government and non governmental organizations (NGO’s) with understaffed government agencies not fully utilizing the grassroots outreach capacity of NGO’s.

The success of the workshop is reflected in the formation of a National Landcare Working Committee This committee has the important mandate to facilitate consultations for the development of a framework that promotes sustainable land management through the coordination and collaboration of all involved agencies with the participation of the local communities. The committee has met several times with representative from, Native Land Trust Board, Dept. of Environment, Forestry Dept., Ministry for Agriculture, Sugar and Land Resettlement (MASLR), Ministry of Provincial Development (NDM0), University of the South Pacific, EU/SPC/DSAP and the SPC/GTZ PGRFP, Ministry of Works, Ministry of Finance, Ministry of Education and Representative of the NGO Landcare Steering Committee.

A NGO Landcare Steering Committee was also formed with members consisting of the various NGO’s such as the World Wide Fund, PCDF, Conservation International, FPSI, Live and Learn and other environmentally based NGO’s.

## **6.0 CONSTRAINTS**

- Absence of a participatory National Land Use Plan.
- Increase demand on arable land.
- Shortage of arable land.
- Over dependence on the sugar industry.
- Use of inappropriate land management technologies.
- Lack of infrastructure
- Lack of knowledge and awareness on provisions of existing land resources legislations.
- Weak institutional linkages.
- Inappropriate land use development in the watershed.
- Poverty.
- Lack of credit facilities for land development.
- Inaccessibility to land resources information.

## 7.0 PROSPECTS AND CHALLENGES

Promoting proper development and conservation of land and water resources through sustainable land management practices. These could be undertaken effectively through the following measures:

- Education and Awareness.
- Development of new agriculture land with proper lease/titles in place.
- Conditions attached to tenancies and leases.
- Planning controls imposed on the use of land.
- Administrative directions, authorised by legislation which allow intervention to stop or prohibit improper land-use practices,
- Prosecution, imposition of penalties and provisions of incentives and,
- Provisions of financial assistance and credits to allow commercial development of land resources.

## 8.0 POLICY OBJECTIVES

8.1 To protect water and soil values

8.2 To increase public awareness that

8.2.1 *Land Resources, including soil water and flora are interdependent and must be managed in an integrated way, an*

8.2.2 *The individual landuser and the community have a responsibility for preventing and or mitigating land degradation.*

8.3 To increase public awareness of the values of tress and forests.

8.4 To develop a regulatory framework for the protection and sustainable development and management of rural land resources that recognizes the following;

8.4.1 *The indigenous forests will be protected and managed for their biodiversity, conservation and production values by adopting Sustainable Forest Management (SFM) principles;*

8.4.2 *Protection of the environment and management of water, land, forestry and other natural resources will be conducted in an ecologically sustainable manner.*

8.4.3 *The planning processes need to outline strategies for the prevention of land degradation as well as the symptoms;*

8.4.4 *The plantation forests must be managed and administered in a manner that sustains site quality;*

8.4.5 *Sound land use practices to maintain and sustain soil qualities.*

8.5 To develop appropriate mechanism to protect farmlands and forests from fire, pest and pathogen.

8.6 To develop research, training and education programs to improve \land assessments and evaluation; land husbandry practices; farm and forestry productivity and values and land use planning.

- 8.7 To establish institutional reform to support and enhance capabilities in all rural sector activities
- 8.8 To develop good governance strategies to expand and diversify sustainable economic activity, increase employment.
- 8.9 To be involved with and contribute to global issues and laws related to the environment, rural development, sustainable land management etc.
- 8.10 To develop strategies for drought mitigation and early warning systems.
- 8.11 To monitor and evaluate land degradation.

## **9.0 NATIONAL ACTION PROGRAM**

### **9.1 NAP Consultation**

Fiji's National Action program was developed after several consultation with key stakeholders such as; Relevant Non Government Organisations, Donor Funded Projects, University of the South Pacific, Secretariat of the Pacific Community and GTZ Regional Forestry Project, South Pacific Geo-Science, Ministry of Agriculture, Sugar and Land Resettlement, Ministry of Provincial Development, Fijian Affairs Board, Native Land Trust Board, CEO's Development Sub-Committee, Community Based Organization, landowners and users.

## 10.0 NATIONAL ACTION PROGRAM FRAMEWORK

Policy Objectives	Strategies	Activities	Key Performance Indicators	Organisations Responsible
1.0 Protection of water and soil values	1.1. Compilation of national soil inventory	1.1.1 Conduct the Soil Inventory Survey of all district in Fiji  1.1.2 Digital capturing of surveyed information into spatial & attribute database	Soil inventory of Fiji Completed by 2010	Ministry of Agriculture
	1.2. Produce a National Land Use inventory of Fiji	1.2.1 Field survey and mapping of present land use 1.2.2 Digital capturing of surveyed information into spatial & attribute database	National Present Land use inventory updated every five years.	Ministry of Agriculture  Forestry
	1.3 Monitor and Evaluate the status of land degradation in Fiji.	1.3.1 Conduct the Land Degradation Assessment of all District in Fiji	Updated report and maps produced every five years	Ministry of Agriculture Forestry Environment NGO'S USP
	1.4. GIS modeling on Water and Soil Parameters for impact assessments.	1.4.1 Acquire and compile climate, soils and plant information.	Land Suitability & Erosion prediction model for Fiji	Ministry of Agriculture Meteorology Forestry
2.0 Increase public awareness that; 2.1 Land Resources including soil, water and flora are interdependent and must be sustainably managed in an integrated way	2.1.1 Public awareness on the sustainable uses of land and water resources.	2.1.1.1 Conduct awareness program on the sustainable use of land and water resources in all Districts of Fiji's 14 Provinces. 2.1.1.2 Develop teaching material on SLM	- 187 training carried out in the 187 Districts by 2009.	NLTB, Ministries of; Agriculture, Education, Forestry, Environment, Finance and National Planning, Provincial Development, Lands and Surveys, Town and Country Planning, FAB, Relevant NGO's, Fiji Hardwood Corporation, Fijian Affairs, Women
	2.1.2. Develop appropriate education and awareness programs for sustainable land	2.1.2.1 Transfer of SLM technologies	- Low cost sustainable land management technologies adopted.	

	<p>based resources management.</p> <p>2.1.3 Development of low cost appropriate SLM technologies</p> <p>2.1.4 Increased Public awareness of the values of trees and forests</p>	<p>2.1.3.1. Adoption of sound land use practices.</p> <p>2.1.4.1 Educational curriculum to include trees and forestry subjects.</p> <p>2.1.4.2 Develop strategic guideline for public access to indigenous forests</p>	<p>Number of Demonstration and Conservation farms established</p> <p>Adoption of sound land use practices</p> <p>2.1.4.1.1 all schools to include tree and forestry subjects in their curriculum</p>	
<p>2.2. The individual land user and community have responsibility for preventing and or mitigating land degradation.</p>	<p>2.2.1. Participatory District Based Land Use planning.</p> <p>2.2.2 Development and Implementation of Participatory Tikina Based Land Use Plan</p> <p>2.2.3. Identification and training of Landcare facilitators.</p> <p>2.2.4. Formulation of Landcare Groups</p> <p>2.2.5 Promotion of Land Care concept</p>	<p>2.2.1.1. Development and Implementation of Participatory Tikina Based Land Use Plan.</p> <p>2.2.1.2 Carry out participatory Tikina Based Land Use Survey</p> <p>2.2.3.1. Landcare facilitators fully trained in SLBRM.</p> <p>2.2.4.1 Identification and training of Landcare facilitators</p> <p>2.2.5.1 Formulation of Landcare Groups</p>	<p>-development and implementation of 187 Tikina Based Land Use Plans</p> <p>187 Tikina Based Land Use Plans.</p> <p>-development of the National Land Use Plan.</p> <p>187 Landcare facilitators fully trained.</p> <p>187 Landcare Groups formed.</p> <p>Number of Land Care Groups formed</p>	<ul style="list-style-type: none"> <li>• Ministry of Agriculture</li> <li>• Provincial Development</li> </ul>
<p>3.0 A regulatory framework for the protection and sustainable development and management of rural land resources</p>	<p>3.0.1 The indigenous forests will be protected and managed for their biodiversity, conservation and production values by adopting SFM principles.</p>	<p>3.0.1.1 Implement the NBASP</p> <p>3.0.1.2. Review and Amend the Forestry Act.</p> <p>3.0.1.3. Develop a Forestry Policy</p>	<ul style="list-style-type: none"> <li>• NBASP implemented</li> <li>• Forestry Act reviewed</li> </ul>	<p>Dept. of Environment, Ministry of Fisheries and Forests, Ministry of Finance and NPO, Agriculture Dept., NLTB, FAB, Ministry of Provincial</p>

	3.02 Protection of the environment and management of water, land, forestry and other natural resources will be conducted in an ecologically sustainable	3.0.1.4 Review and Amend the LCIA  3.0.1.5 Develop a Land Use Agriculture Policy  3.0.1.6 Develop a Tourism Policy	<ul style="list-style-type: none"> <li>• Forestry Policy developed</li> <li>• LCIA amended</li> <li>• Agriculture Landuse Policy developed</li> <li>• Tourism Policy developed</li> </ul>	Development, Dept.of Mineral Resources, Lands Dept.,Relevant NGO's, Ministry of Tourism.
3.1 The plantation forests must be managed and administered in a manner that sustains site quality.	3.1.1 Implement the principles of Sustainable Forestry Management( SFM)	3.1.1.1 Develop and established demo sites for SFM technologies	Demo sites established.	Forestry Dept. Fiji Pine Ltd, NLTB, Fiji Harwood Corporation, National Trust of Fiji Dept. of Environment. Relevant NGO's, Min. Fijian Affairs
4.0 An effective involvement with and contribution to global issues and laws related to the environment, rural development, sustainable land management, etc.	4.0.1 Facilitating participation on regional, sub-regional and international co-operation.	Implementing the conventions concerning environment and sustainable development.  Strengthening the exchange of information and expertise.	National Action Plan Developed for UNCCD, UNFCC, UNCBD, Increased linkages & accessibility to international and regional website	Ministry of Agriculture Forestry Environment
5.0 Develop a strategy for drought mitigation and early warning systems. 10.0 Increase awareness in disaster mitigation	5.0.1 Develop a strategy for drought mitigation and early warning systems.	5.0.1.0 Increase awareness, preparedness and response plan. 9.0.1.1 Improve climatic monitoring system	5.0.1.0.0 Disaster Management Act reviewed 9.0.1.0.1 Response Plan	Ministry of Environment, MASLR, P.W.D, Meteorology, Ministry of Health, Provincial Development

## 11.0. NATIONAL ACTION PROGRAM PROJECT PROPOSAL

<b>Project 1</b>	Development of an Institutional Capability for Integrated Land Use Planning
<b>Objective:</b>	To establish an independent Land Use Authority, staffed with a range of appropriate expertise, having access to authority and direct support to the executive; the Authority having both the support of the rural people and authority and resources of government.
<b>Rationale:</b>	In general, individual land users are not always well aware of the consequences of their actions with the land. This is in part due to lack of information about ‘best practice’, legislation and sources for technical support. Without long-term planning and government intervention about rural land use options and issues we have a ‘market forces’ environment i.e. where a large number of land use/practice decisions are being taken by many land users for their own private ends. Current climatic, economic and social pressures are forcing many land users into actions to satisfy their short-term needs – actions that can have adverse long-term consequences.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Assess institutional constraints, land use and legislation policy,</li> <li>2. Conduct extensive consultation with land users, government officials and the public at large,</li> <li>3. Recommend preferred institutional model for facilitating land use planning,</li> <li>4. Recommend human, financial and other resources required to support a Land Use Authority,</li> <li>5. Develop strategic and business plans for the Authority,</li> <li>6. Define job descriptions, roles and responsibilities and, based on a needs assessment, a training programme, and</li> <li>7. Establish the Land Use Authority and implement recommendations.</li> </ol>
<b>Personnel:</b>	<ol style="list-style-type: none"> <li>a) Initial consultancy – Land Use Planner (1 month) and Institutional Specialist (1 month),</li> <li>b) Implementation of independent Land Use Authority – as recommended by above consultancy.</li> </ol>
<b>Government Contribution:</b>	Facilities and personnel for Authority and support land use planning team.
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Recommendations for establishment of Land Use Authority (LUA) should be prepared by end of 2010,</li> <li>2. LUA established by January, 2010.</li> </ol>
<b>Duration:</b>	3 months

<b><u>Project 2</u></b>	<b><u>National Land Use Planning</u></b>
<b>Objective:</b>	To prepare a participatory national land use plan based on physical land resource evaluation and extensive formal public consultation.
<b>Rationale:</b>	A national land use plan would assist in appropriate land use and resource allocation – basic prerequisites of sustainable development. There is an urgent need for information and modern ‘tools’ by authorities to provide effective and efficient approaches to the generation, collation and interpretation of land resources data for land use planning purposes.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Assess land use policy and legislation,</li> <li>2. Select methodologies and develop approach,</li> <li>3. Conduct formal public consultations,</li> <li>4. Collate biophysical data from land resource surveys,</li> <li>5. Evaluate land suitability and generate maps via GIS,</li> <li>6. Evaluate and apply land use models from land information system,</li> <li>7. Analyse environmental, economic and social impacts,</li> <li>8. Develop and present viable land use options at public fora, and</li> <li>9. Prepare the land use plan.</li> </ol>
<b>Personnel:</b>	<ol style="list-style-type: none"> <li>a) Initial consultancy – Land Use Planner (1.5 months),</li> <li>b) Preparation of Land Use Plan – as recommended by above consultancy.</li> </ol>
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Facilities for Land Use Plan consultant team,</li> <li>• Counterparts to the Specialists,</li> <li>• Physical and natural resource data.</li> </ul>
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Terms of reference for National Land Use Plan should be prepared by March 2005,</li> <li>2. Preparation of the National Land Use Plan have commenced by early 2005.</li> </ol>
<b>Duration:</b>	5 years.

<b>Project 3</b>	<b><u>National Land Zoning</u></b>
<b>Objective:</b>	To prepare a 1:25,000 scale national land zoning map (plus 1:5,000 scale zoning maps in the peri-urban areas) with definitions and guidelines for each zones as to rationalise location and direction of future non-rural land uses and to protect that class of land for food production.
<b>Rationale:</b>	Land use zoning in the agricultural sector is long overdue; as a result there are clashes in land requirements for various uses. Industrial, commercial, residential and other developments are occupying large tracts of valuable agricultural land due to the absence of sound planning and until recently, unavailability of accurate crop-specific and land use suitability classifications.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. List the range of potential land uses,</li> <li>2. Collate natural resource information in GIS,</li> <li>3. Generate specific use-suitability and general land use maps from GIS,</li> <li>4. Map recommended land zones and boundaries of protected areas,</li> <li>5. Define land zones and guidelines for use within each zone,</li> <li>6. Conduct extensive consultation with land users/owners, officials and the public at large, and</li> <li>7. Publish various scale land zoning maps (national and peri-urban).</li> </ol>
<b>Personnel:</b>	<ol style="list-style-type: none"> <li>a) Initial consultancy – Land Use Planner (2 months),</li> <li>b) Preparation of national land zoning maps and guidelines – as recommended by above consultancy.</li> </ol>
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Facilities for Land Zoning Planning team,</li> <li>• Physical Planner, GIS Specialist and counterparts to all Specialists,</li> <li>• Physical and natural resource data.</li> </ul>
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Terms of reference for National Land Zoning Project should be prepared by June 2007,</li> <li>2. Preparation of national land zoning map with guidelines should have commenced by November, 2007.</li> </ol>
<b>Duration:</b>	6 months.

<b>Project 4</b>	<b><u>National Contemporary Land Use Mapping</u></b>
<b>Objective:</b>	To produce a 1:50,000 scale contemporary land use map of the Republic using remotely sensed data and field survey techniques.
<b>Rationale:</b>	The provision of basic data on contemporary land use changes in area under cultivation or changes of crop types is fundamental and a prerequisite to all rural, particularly agricultural development planning.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Map contemporary land use using remote sensing techniques or image processing of satellite imagery,</li> <li>2. Ground truthing and field mapping using GPS,</li> <li>3. Upgrade GIS to handle raster data,</li> <li>4. Training in image processing and image enhancement applications,</li> <li>5. Digitise land use maps from 1968 and 1978 surveys,</li> <li>6. Process, collate and interpret field and remotely sensed data,</li> <li>7. Generate national contemporary land use map (1:50,000 scale), and</li> <li>8. From GIS derive interpretative single-factor land use maps, statistical data and trends in land use.</li> </ol>
<b>Personnel:</b>	<ol style="list-style-type: none"> <li>c) Initial consultancy – Land Use Planner (1 month),</li> <li>d) Implementation of Land Use Mapping Project – as recommended by above consultancy.</li> </ol>
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Contemporary national aerial photography coverage,</li> <li>• Facilities for Land Use Mapping team including GIS facilities,</li> <li>• GIS Specialist and the full support of Land Use Section, MAFFA.</li> </ul>
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Design and scope for national land use map prepared by June, 2006,</li> <li>2. National land use map available December, 2007.</li> </ol>
<b>Duration:</b>	15 months.

<b>Project 5</b>	<b><u>Integrated Rural Resource Database Development and Applications</u></b>
<b>Objective:</b>	To develop a computerised Land Resources Information System (LRIS), comprising thematic databases covering agroclimatic factors, soils, topography, vegetation and present land use, linked to a GIS to display combination of these, and other data in support of rational land use policy, planning and utilisation.
<b>Rationale:</b>	National resource information is currently available only with difficulty – held amongst different agencies and in various formats and not based on uniform standards of data or procedures. The definition and mapping of the possible extent of kinds of sustainable land use, land productive capacity, a system for land use zoning that protects the natural resources etc., require accurate and integrated information on land resources, the potential for alternative kinds of land use, costs and benefits of land use and operations.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Provide explanation of concepts, discussion and agreement in details of the design,</li> <li>2. Identify data sources, and agreement on responsibilities for data acquisition, verification and digitisation (where appropriate),</li> <li>3. Collect, collate, install databases and input data into GIS,</li> <li>4. Integrate physical, socio-economic and cadastral information,</li> <li>5. Install crop environmental requirements and production systems' databases and provision of suitable interface with the GIS,</li> <li>6. Collect and input data,</li> <li>7. Develop database of socio-economic information,</li> <li>8. Adopt and apply systems of land evaluation, and</li> <li>9. Estimate potential yields from combinations of products (crops), production systems, and land/climate units.</li> </ol>
<b>Personnel:</b>	<ol style="list-style-type: none"> <li>a) Initial consultancy – Land Resource Evaluation Specialist (1 month) and GIS Specialist (1 month),</li> <li>b) Develop LRIS as designed and recommended by above consultancy.</li> </ol>
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Facilities for LRIS development team (hardware/software provided by donor),</li> <li>• Physical, natural resource, land use data sets,</li> <li>• Selected Database and GIS Specialists and counterparts to the consultants.</li> </ul>
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Terms of reference and design for LRIS prepared by March 2006,</li> <li>2. Implementation of LRIS should have commenced by mid 2006.</li> </ol>
<b>Duration:</b>	2 years

<b>Project 6</b>	<b><u>Adaptive Research and Extension in Land Husbandry Technologies</u></b>
<b>Objective:</b>	To develop a well-resourced and integrated research and extension program comprising suitably qualified MAF staff conducting adaptive sustainable land management (SLM) and 'best practice' research and effectively disseminating ecologically sound and socially acceptable land husbandry technologies to land users through targeted and innovative techniques.
<b>Rationale:</b>	The almost complete utilisation of first class arable land means that the current expansion of agriculture into marginal hill areas and steeplands will continue. Some agricultural practices, i.e. sugar cane and ginger production on slopes >11° are not sustainable; they increase natural erosion rates, which are already high and are responsible for significant areas of land going out of production annually. Unsustainable land use on such lands has seen unacceptable soil losses and sedimentation of key waterways, for example, in the Ba valley, some 12,000 ha of sugar cane land and 35,000 ha of grasslands are badly eroded.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Conduct extensive rural participatory meetings with farmers/land users to understand needs, problems and constraints,</li> <li>2. Evaluate and recommend appropriate institutional model for SLM research and extension within MAF,</li> <li>3. Assess training needs and development of training plan,</li> <li>4. Design targeted research and extension program with implementation schedule and forward budgets,</li> <li>5. Further the consultative process with farmers and land users, and</li> <li>6. Implement program in concert with a media awareness program (project 7).</li> </ol>
<b>Personnel:</b>	Crop Research Specialist (3 months), Institutional Training Specialist (1 month), Rural Sociologist (1 month) and Land Husbandry/Extension Specialist (2 months).
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Facilities for consultants' team,</li> <li>• Counterparts to the Specialists,</li> <li>• Provision of previous reports, reviews, financial and HRD information, etc.</li> </ul>
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Terms of reference for consultancy prepared by September,2006.</li> <li>2. Program with recommendations designed and available December, 2006.</li> </ol>
<b>Duration:</b>	4 months.

<b>Project 7</b>	<b><u>National Sustainable Land Management, Education and Awareness Program</u></b>
<b>Objective:</b>	To create a high level of public understanding about land use policy and legislation, in particular specified land-husbandry and ‘best practice’ clauses in land leases with the purpose of reducing land degradation and increasing productivity from the land through sustainable land management (SLM).
<b>Rationale:</b>	Future economic activity will lead to increasing competition for the use of land resources and increases in population can be expected to dramatically accelerate land degradation. There is a very poor understanding about legislation, policy and ‘best practice’ pertaining to land use and management. NLTB and MAF research and extension advice to land users, landowners and farmers is seriously wanting.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Consult with the ‘market’ as to needs, then design a program to meet these,</li> <li>2. Prepare printed materials, brochures, information sheets, manuals, guidelines, handbooks and education program,</li> <li>3. Develop radio and video material to promote SLM practices,</li> <li>4. Implement structured education courses for farmers, women, NGOs, student of community groups,</li> <li>5. Provide support for organisations with interests in SLM,</li> <li>6. Prepare and distribute information packs as teaching aids for use in schools, and</li> <li>7. Conduct evaluation.</li> </ol>
<b>Personnel:</b>	<ol style="list-style-type: none"> <li>c) Initial consultancy – Land Husbandry/Farming Systems Specialist (2 months), Rural Sociologist (1.5 months) and Education/Media Specialist,</li> <li>d) Implementation of programme – as recommended by above consultancy.</li> </ol>
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Facilities for consultants’ team,</li> <li>• Counterparts to the consultants,</li> <li>• Provision of graphic artists, scriptwriters and journalists.</li> </ul>
<b>Targets:</b>	<ol style="list-style-type: none"> <li>1. Terms of reference for consultancy prepared by September 2006,</li> <li>2. Awareness Program designed and available December 2006.</li> </ol>
<b>Duration:</b>	3 months.

<b>Project 8</b>	<b><u>Improve the capacity and quality of human resources within Government for land management and land use planning</u></b>
<b>Objectives</b>	<p>Strengthen the Government capacity for policy making, administrating and facilitating the delivery of quality natural resource information, land management advice and land use planning services.</p> <p>Improve the quality of basic land information for land use planning through improved skills in the collection, mapping and interpretation of natural resource information.</p> <p>Promote understanding about the importance of zoning and land use planning for the conservation of land resources and sustainable growth.</p>
<b>Rationale:</b>	Establishing a Land Use Authority and a Technical Unit to develop and implement a national land use plan requires skilled staff in responsible parts of Government to be fully conversant about how the information for the plan is derived, the land use planning process, how plans are to be used and responsibilities. Also, to be competent in managing their Department's responsibilities for all steps in the land use planning process. For land use planning to be effective and have positive impacts, end-users and other stakeholders are appreciative about the purpose and all that is involved in the land use planning process; so relevant Departmental staff need to also be skilled in creating awareness.
<b>Activities:</b>	<ol style="list-style-type: none"> <li>1. Assess training needs,</li> <li>2. Identify needs and numbers for long-term and short-term specialist training,</li> <li>3. In consultation with CEOs (or nominees) prepare referral manual as to Ministries' legal responsibilities,</li> <li>4. Develop capacity-building training plan,</li> <li>5. Prepare training manual designed to also function as an ongoing referral document by trainees,</li> <li>6. Conduct relevant training in legislative responsibilities,</li> <li>7. Conduct one-day training in land use planning for Managers,</li> <li>8. Conduct intensive training in land use planning (including field trips) for practitioners.</li> </ol>
<b>Personnel:</b>	<ul style="list-style-type: none"> <li>• Land Use Planner/Trainer (2 months)</li> <li>• Land Use Planner counterpart (2 months)</li> <li>• Counterpart GIS Specialist (1 month)</li> </ul>
<b>Government Contribution:</b>	<ul style="list-style-type: none"> <li>• Training facilities (including visual aids equipment)</li> <li>• Key Departmental staff available when required</li> <li>• Reproduction of manuals and other training materials.</li> </ul>
<b>Targets:</b>	<ul style="list-style-type: none"> <li>• Training needs assessment and plan, Terms of Reference for training, and preparation of training manual by June 2006.</li> <li>• Conduct legislative and manager's training, and conduct intensive land use planning by December 2006.</li> </ul>
<b>Duration:</b>	6 months.

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