National Report on Desertification/Land Degradation in Sri Lanka

2000

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INTRODUCTION

The United Nations Convention to Combat Desertification defines desertification to mean land degradation in arid, semi - arid and sub-humid areas resulting from various factors including climatic variations and human activities. Arid, semi-arid and sub humid areas refer to areas other than polar and sub- polar regions where the ratio of annual precipitation to potential evapotranspiration falls within the range of 0.05 to 0.65.

No part of Sri Lanka falls within the range of ratios specified in the Convention. However within the Dry Zone which is conventionally defined as the area receiving less than 1900 mm of rainfall annually, where the ratio of annual rainfall to potential evaporation falls within the range 0.05 to 0.65 during a major part of the year due, in part to the very low rainfall received and inpart to the low water holding capacity of the soils. Considering the monthly variations in evapotranspiration, frequent droughts experienced, anticipated climatic changes and the accelerated land degradation that is taking place due to human activities, it is likely that desertification may emerge as a problem in the Dry Zone in the near future.

Land degradation however is not confined to the Dry Zone. It is a severe problem in the Wet Zone as well, especially in the mid-country where steep slopes, high intensity rainfall and inappropriate land uses have led to high rates of soil erosion, landslides etc. Land degradation therefore has to be treated as a problem that is widespread, occurring in all of the agro-climatic zones at varying intensities.

1. LAND DEGRADATION – NATURE AND MAGNITUDE OF THE PROBLEM IN SRI LANKA

It is widely accepted that land degradation is one of the most critical problems affecting the future economic development in Sri Lanka. The demands of a rapidly expanding population has set up pressures on the island's natural resources and these in turn have resulted in a high level of environmental degradation. The more important manifestations are heavy soil losses; high sediment yields; soil fertility decline and reduction in crop yields; marginalization of agricultural land; salinization; land slides and deforestation and forest degradation.

(a) Heavy Soil Losses

It has been estimated that nearly one third of the land in Sri Lanka is subjected to soil erosion, the erodible proportion ranging from less than 10.0% in some districts to over 50.0% in others.

Severe erosion takes place in the hill country on sloping lands under market gardens (vegetables and potatoes) tobacco, poorly managed seedling tea and chena cultivation.

Soil erosion is also considered a threat to agricultural production in the rainfed farming areas in the Dry Zone.

(b) High Sediment Yields

A part of the soil that is removed is transported by rivers and streams leading to sedimentation of reservoirs, downstream floods etc., commonly referred to as the off-site effects of soil erosion. Some recent studies undertaken within the Upper Mahaweli catchment have shown high rates of sediment yield in some rivers. Sedimentation is also taking place in small village tanks in the Dry Zone.

(c) Soil Fertility Decline and Reduction in Crop Yields

It is commonly believed that the depletion of soil fertility has led to a loss of productivity of agricultural lands in the country. The decline in yields of major food crops as well as

plantation crops over the past several decades has been attributed to the loss of valuable top soil due to erosion. It is widely accepted that agriculture on sloping lands in many areas is generally maintained by the artificial replacement of nutrients removed by erosion.

Economic cost of soil erosion

The on-site and off-site costs of soil erosion have been estimated in recent studies. Some of the estimates are given below.

(A) On-site cost

1. Value of loss of productivity - Rs. 3529 ha/yr
2. Value of loss of nutrients - Rs.5068 ha/yr
3. Estimated cost due to nutrient loss in Upper Mahaweli watershed - Rs. 953.0 million

(B) Off-site cost

1. Based on value of loss of productivity – Rs. 3952 ha/yr
2. Based on value of loss of nutrient – Rs. 5481 ha/yr
3. Estimated loss in hydro-power production and irrigation from the Upper Mahaweli Watershed – Rs. 15.0 million per annum

(d) Salinization and Water Logging

Records of the actual extent of land affected by salinity nor data that indicate recent trends are available, but sporadic studies seem to indicate the development of salt affected soils in low land areas in the Dry Zone.

Salinization of low- lying farm lands in coastal areas due to salt water intrusion is also a problem.

Although water-logging is not considered a serious problem nevertheless some lands in the coastal districts of the Wet Zone have been withdrawn from agriculture due to excess water.

(e) Marginalization of Agricultural Land

A sizeable extent of agricultural land in different parts of the country have become marginal or uneconomic. It has been estimated that there are now 1.2 millions hectares of land mostly in the Dry Zone which are unproductive and put to only limited use.

It has also been estimated that at least 30.0% tea lands in the country can be considered as marginal or uneconomic

A substantial portion of the remaining unutilized state lands is also considered to be marginal in nature.

(f) Landslides

A reconnaissance survey carried out in landslide prone areas has indicated that approximately 12,500 square miles are vulnerable to landslides. The available evidence seems to indicate that the country has been experiencing a spate of landslides over extensive areas in the central and south-western parts of the country, since the early eighties.

(g) Deforestation and Forest Degradation

The natural forest cover in the country which stood at 80.0% until the turn of the century had dwindled to less than 24.0% by 1992. The deforestation has taken place both legally and illegally. Legally forests have been cleared for agriculture and settlement schemes and other development projects. They have been cleared illegally for shifting cultivation and for agriculture and settlement by encroachers.

The quality of the forests in the country has also been declined due mainly to shifting cultivation, illicit felling of trees and encroachments.

DROUGHTS

Droughts have a very serious negative impact on the economic and social life of the country. All parts of the country are subject to droughts. A study of drought conditions over Sri Lanka during January to March in three “drought” years 1983, 1987 and 1992,

indicated that the total area of the country which received less than 10% of the average rainfall for January- March (1951-1980) amounted to 55% in 1983, 40% in 1992 and 11% in 1987. A part of this area was in the Wet Zone and a part in the Dry Zone.

The problem of drought is particularly severe in the Dry Zone where the failure of rains in the main cultivation season, September to March can spell disaster to thousands of families depending on rainfed agriculture for their livelihood. Of the 11 districts that received less than 10% of the average rainfall (January- March 1951-1980) from January to March in 1983, 8 were in the Dry Zone. It has also been shown that the probability of the occurrence of drought in both Maha and Yala is greater in the Dry Zone than in the Wet Zone(Table 1).

Research studies have shown that Dry Zone farmers adjust to drought in a number of ways. Some depend on borrowings, some take up non-agricultural employment, some use up food reserves and some depend on borrowings. In addition they also depend on relief assistance provided by the government. The government expenditure on drought relief in the years in 1983, 1987 and 1992 amounted to Rupees 87.9 million, 72.9 million and 203.0 million respectively.

TABLE 1

PROBABILITY OF DROUGHT IN MAHA AND YALA[1]

DISTRICT	Rainfall	Probability of drought	Rainfall	Probability of drought
	YALA[2] (m.m.)	YALA[3]	MAHA[2] (m.m.)	MAHA[3]
Anuradhapura	338	0.30	1009	0.20
Ampara	260	0.16	1359	0.18
Badulla	588	0.18	1371	0.10
Batticoloa	222	0.34	1481	0.18
Hambantota	388	0.22	714	0.22
Jaffna	193	0.38	1095	0.18
Kilinochchi	229	0.36	1167	0.18
Kurunegala	787	0.24	1218	0.14
Mannar	783	0.02	625	0.18
Matale	584	0.22	1235	0.20
Monaragala	783	0.18	1250	0.20

Mullaitivu	153	0.10	731	0.00
Puttalam	526	0.20	898	0.16
Polonnaruwa	296	0.32	1286	0.18
Trincomalee	322	0.22	1332	0.14
Vavuniya	353	0.24	1084	0.22
Colombo	1613	0.10	1885	0.06
Galle	1330	0.04	1673	0.04
Gampaha	1137	0.10	1414	0.20
Kalutara	1748	0.08	2006	0.06
Kandy	884	0.10	1828	0.12
Kegalle	1896	0.08	1952	0.04
Matara	1075	0.16	1495	0.06
Nuwara Eliya	1174	0.18	1244	0.06
Ratnapura	1777	0.08	1937	0.06

[1] Dharmaratne, G.H.P. and S.H. Kariyawasam. "DROUGHTS". Paper presented at the seminar on "Natural Disaster Reduction", Oct.15-16, 1990, Colombo. Co-sponsored by Federationof Engineering Institutions of South and Central Asia.

[2] Average for the period 1931 to 1980.

[3] Drought season - less than 75% of average seasonal rainfall.

[4] Districtwise drought probability

No. of occurrences of drought in Yala (Maha) during the period

Total number of years considered

Recommendations:

(1). Undertake an in-depth study of the Nature and Magnitude of Impending Desertification in Sri Lanka.

(2). Since Indicators of Desertification in Sri Lanka are somewhat different from those used in Arid, Semi-arid and Sub-humid areas, it is recommended that a set of indicators be developed to determine the Nature and Magnitude of Desertification in Sri Lanka.

(3) Undertake in-depth studies to determine the precise extent of land degradation in Sri Lanka.

2. NATIONAL POLICIES, STRATEGIES AND PLANS PREPARED TO ADDRESS LAND DEGRADATION ISSUES

The Government's growing concern about environmental issues in general and land degradation in particular over the past two decades or so is reflected in the different policy initiatives that have been taken, the strategies that have been formulated and the plans that have been prepared. The more important policy initiatives, strategies and plans relevant to combating land degradation are outlined below:

Policy Statements

People in Sri Lanka have been living in harmony with the environment for many centuries while utilizing natural resources to meet their requirements. This strong conservation tradition was first disturbed in the latter half of the nineteenth century with the land use changes that were introduced in different parts of the country. The harmonious relationship between man and nature has been further disrupted in the twentieth century due to a number of reasons such as the expanding population, the growing demand for resources and the increase in rural poverty.

The need to reverse the current attitudes towards resource exploitation prompted the Government to include two important clauses in the second Republican Constitution adopted in 1978.

1. " The state shall protect, preserve and improve the environment to the benefit of the community"
2. " The exercise and employment of rights and freedoms is separable from the performance of duties and obligations and accordingly it is the duty of every person in Sri Lanka to protect nature and conserve its riches"

These objectives were not rigidly followed and as a result environmentally damaging practices particularly within the agricultural and forestry sectors continued unabated. The need to take remedial action was recognized by the new government that came in to power in 1994, and the President in her Policy Statement made on the occasion of the

opening of the new Parliament in 1995 outlined a program of action for the agricultural sector which included two major reform initiatives intended to encourage conservation farming and to promote the sustainable management of natural resources. A declaration was made that:

1. " Farmers will be encouraged to adopt a co-ordinated approach to land use on small farms, based on micro catchments and integrate all activities in the farm in to a single development work plan" and " the adoption of appropriate land and water management will be promoted as an integral part of the crop-stock production process".
2. " Environmental guidelines will be developed an enforced through a combination of regulations and market incentives to ensure that land, water, forestry and fisheries resources are utilized in a sustainable manner".

NATIONAL POLICIES

(i). National Forestry Policy – 1995

The forestry sector has been facing a number of problems. These include, the continuing decrease in the forest cover; the expanding conflicts between forestry and agriculture; the ineffectiveness of the efforts at protecting forests; the inefficient management of state owned forests; the inability of the forests to meet the further demands for wood; and inequities in the distribution of benefits from forest resources. The forestry policy was formulated to address these issues.

(ii). National policy framework - Ministry of Agriculture Lands and Forests-1995

The National Policy Framework was prepared to realize policy objectives spelt out in the election manifesto of the People's Alliance prior to the General Election held in 1994. The document synthesized some of the fundamental principles and perspectives for a National Policy Framework in the three sectors of Agriculture, Lands and Forestry which were brought within a single Ministry after 1994. The framework declared that a national land policy for Sri Lanka has been long overdue and that haphazard allocation of allocation of state lands without proper and systematic land use planning has caused

enormous damage to the land base of the country and consequently to the environment. It went on to add that "Given the fragile nature of this scarce natural resource which is vital for the continuing sustenance of life in all its forms it is essential that we manage it with care and efficiency, so that its benefits would accrue not only to our generation but also to generations yet to come on whose behalf we hold it in trust"

(iii). National land use policy (draft) - 1996

The specific objectives of the land use policy is to, to promote land suitability evaluation and allocation of land rationally among competing uses; to ensure that the utilization of land is based on the capability of land and the needs of both the community and the national economy; to enhance the productivity of the land resources to the optimum levels; to ensure food and food security in the long run; to promote land uses that will minimize environmental damage; to reduce vulnerability to natural and man-made disasters; to ensure orderly economic growth and balanced regional development; to reduce dependence on land as a means of providing employment opportunities; to promote a rational distribution of population and settlements and; to harmonize or integrate diverse and complex objectives for management and development of land by different agencies.

(iv). National Water Resources Policy – 2000

The National Water Resources Policy is a statement of the government's intentions regarding the management of the country's inland water. The policy adopts and "indicated" approach which recognizes natural linkages. Emphasis is placed on water resource management within river basins and acquiffers, including both upstream and downstream water uses, government and other stakeholders.

NATIONAL STRATEGIES

(a) The National Agriculture, Food and Nutrition strategy - 1984

The National Agriculture Food & Nutrition Strategy, which was formulated in 1984, aimed at assessing Sri Lanka's agriculture and food situation along with the establishment of priorities for future sectoral development. The strategy recognized that

the proper management of land resources was crucial for the future agricultural development of the country.

(b) The National Conservation Strategy - 1988

Accelerating environmental degradation in most parts of the world within the past few decades prompted the International Union for the Conservation of Nature and Natural Resources (IUCN) to assume responsibility to alert governments to the need to conserve their natural resources. The IUCN prepared the necessary guidelines and the government recognizing the importance of the objectives laid down by the organization decided to prepare a National Conservation Strategy in 1982. National policy on the conservation and development of natural resource was set out in this strategy.

NATIONAL PLANS

(a) National Environmental Action Plan (1992)

The National Conservation Strategy was subsequently develop into an action oriented plan by the Central Environmental Authority in close collaboration with relevant ministries, government agencies and non-governmental agencies. In the mean time, the World Bank had expressed its interest in providing environment assistance to the country and initiated the preparation of an Environmental Action Plan (EAP). This document was completed in 1990 and included the more important recommendations of the draft NCS plan.

Based on a policy decision, the core contents of the Action Plan, the EAP and the Sri Lanka National Report submitted to the UN Conference on Environment and Development in 1992, were combined to produce a comprehensive National Environmental Action Plan (1992-1996). The National Environmental Action Plan was updated in 1991. A third National Environmental Action Plan (NEAP) has been prepared for the period 1998 to 2001, with sets out the agenda for the 21st century.

(b) Forestry Sector Master Plan - 1995

The Forestry Sector Master Plan (FSMP) has been described as a comprehensive bio-physical, environmental, socio-political and economic projection of the forestry sector's development, intended to guide decision making at national, regional and local levels. It is based on the new forestry policy referred to above and spells out the measures required to achieve the objectives as far as possible.

(c) Coastal Zone management Plan – 1997

The Coastal Zone Management Plan outlines interventions to reduce coastal erosion, minimize depletion and degradation of coastal habitats and minimize loss and degradation of areas of archaeological, historical, recreational and scenic value.

(d) Biodiversity Action Plan - 1998

The Biodiversity Action Plan outlines the principles, goals and broad objectives of biodiversity conservation and submits proposals for action in the major eco-systems i.e. forests, wetland, coastal & marine systems and agricultural systems.

(e) Natural Disaster Management Plan (NDMP) – 1999

The NDMP covers for major phases of Disaster Management identified as mitigation, preparedness, response and recovery. The vital areas covered in the NDMP include, preparedness, mitigation and preventive action; recovery, relief, rehabilitation and re-construction; control of floods, landslide hazards and cyclones; and improvement of meteorological observation, forecast and warning systems.

Recommendations:

1. Finalize National Land Use policy.
2. Implement recommendations pertaining to Combating Land Degradation made in the National Environmental Action Plan as a matter of priority.

3. CURRENT INSTITUTIONAL FRAMEWORK FOR ADDRESSING LAND DEGRADATION ISSUES

The task of protecting and sustainably managing the environment is shared by the number of state institutions and non-state institutions including the private sector and non-governmental organizations. The state sector institutions includes a number of Ministries and their line departments and agencies at the national level; provincial Ministries of environment, Lands and Agriculture at the sub-national level and mainly *Pradeshiya Sabhas* at the local level.

I. STATE SECTOR INSTITUTIONS

(i) National level institutions

There are nine ministries directly involved in addressing issues pertaining to land degradation. The nine Ministries are:

1. Ministry of Forestry and Environment
2. Ministry of Agriculture and Lands
3. Ministry of Mahaweli Development
4. Ministry of Irrigation and Power
5. Ministry of Plantation Industries
6. Ministry of Urban Development and Housing
7. Ministry of Public Administration and Home Affairs
8. Ministry of Plan Implementation and Parliamentary Affairs
9. Ministry of Education and Higher Education

The ministries and their relevant line departments and agencies are given in Figure 1. A classification of the departments and agencies coming under the nine ministries according to the activities undertaken in given below:

Fig. 1 National level state institutions

Ministries	Ministry of Forestry & Environment	Ministry of Agriculture & Lands	Ministry of Mahaweli Development	Ministry of Irrigation & Power	Ministry of Plantation Industries	Ministry of Urban Development & Housing	Ministry of Public Administration & Home Affairs	Ministry of Plan Implementation & Parliamentary Affairs
Departments	Forest Department	Department of Agriculture Department of Export Agriculture Department of Agrarian Services Land Commiss-ioner's Dept.		Irrigation Dept.			Dept. of Wild Life Conservation	Regional Development Division
Agencies	Central Environmental Authority	Land Use Policy Planning Division Hector Kobbekaduwa Research & Training Institute Hadabima Authority of Sri Lanka Natural Resources Management Centre	Forestry & Environment Division	Water Resources Board Land & Water Use Division	Tea Small Holdings Dev. Authority Tea Research Institute Rubber Research Institute Coconut Research Inst. Cashew Corp.	Water Supply & Drainage Board National Building Research Organization		I.R.D.P. Projects

Protection and management of natural resources

1. Forest Department (Ministry of Forestry & Environment)

2. Department of Wildlife Conservation (Ministry of Public Administration & Home Affairs)

3. Central Environmental Authority (Ministry of Forestry & Environment)

4. Water supply and Drainage Board (Ministry of Urban Development & Housing)

B. Promoting Soil Conservation Activities

1. Forestry and Environment Division (Mahaweli Authority of Sri Lanka)

2. "Hadabima" Authority of Sri Lanka (Ministry of Agriculture)

3. Integrated Rural Development Programs (Ministry of Plan Implementation & Parliamentary Affairs)

4. Tea Research Institute (Ministry of Plantation Industries)

5. Coconut Research Institute (Ministry of Plantation Industries)

6. Rubber Research Institute (Ministry of Plantation Industries)

7. Natural Resources Management Centre (Ministry of Agriculture & Lands)

C. Promoting the Sustainable Management of Land Resources and Land Use Planning

1. Natural Resources Management Centre (Department of Agriculture)

2. Land Use Policy Planning Division (LUPPD) (Ministry of Agriculture and Lands)

3. Environment and Forest Conservation Division (Mahaweli Authority of Sri Lanka)

4. Agrarian Services Department (Ministry of Agriculture and Lands)

5. The Land Use Division (Irrigation Department – Ministry of Irrigation & Power)

D. Awareness Creation, Training and Research

1. Natural Resources Management Centre

2. The Environmental and Forest Conservation Division

3. The Rubber Controllers' Department and the Coconut Cultivation Board

4. Universities

5. The National Building Research Organization (NBRO)

ii. Institutional Mechanisms for Integrating Environment and Development

Although there are a large number of agencies addressing land degradation issues there is no mechanism to integrate and co-ordinate their activities. The Ministry of Forestry and Environment has filled this lacuna by creating two new institutions at the national level –
(a) Committees on Environment Policy and Management (CEPOMs) and
(b) Committee on Integrating Environment and Development (CIEDP).

1. Committees on Environment Policy and management (CEPOMs)

Eight CEPOMs have been established to cover the major sectors i.e. Land and Minerals, Water, Bio-diversity, Coastal and Marine, Industry, Urban and Built Environment, Energy, Climate and Environmental Health. Each CEPOM is expected to strengthen the co-operation and co-ordination amongst public and private sector agencies including N.G.O's implementing plans and programmes.

2. Committee on Integrating Environment and Development

It has been recognized that CEPOMs may not be able to handle all the issues that they encounter because the environment is a cross cutting subject and many issues are therefore interconnected. The problem has been overcome by establishing a CIEDP which is expected to examine and provide policy directions on issues referred to by the CEPOMs.

II. SUB NATIONAL LEVEL INSTITUTIONS

The responsibility for protecting and managing the environment at the sub national level is in the hands of Provincial Councils. This responsibility stems from the Thirteenth Amendment to the Constitution of the Government of Sri Lanka which devolved to the

provinces, land administrative functions and the protection of the environment within the province.

Recommendations:

1. Committees on Environment Policy and Management (CEPOMS) should be made to function as intended.
2. Increase the capabilities of the institutions involved in land resource management to enable them to perform their roles effectively.
3. A rationalization and re-definition of mandates and responsibilities should be undertaken to avoid or minimize conflicts of interests.
4. The need to establish appropriate sub- national level institutions to enable Provincial Councils to discharge the environment related responsibilities placed on them should be explored.

4. LEGISLATION ENACTED TO ADDRESS LAND DEGRADATION ISSUES

4.1. LAND RESOURCES

Two strategies have been adopted by the government to address the problem of soil erosion. One is to incorporate environmental safeguards in legislative enactments pertaining to land and water resources development. The other is to introduce legislation specifically designed to prevent or mitigate soil erosion.

(a). Environmental Safeguards

Environmental Safeguards have been incorporated in several pieces of legislation introduced since the nineteen thirties.

1. *LAND DEVELOPMENT ORDINANCE NO.19 – 1935*

Section 8 Subject to the general or special direction of the Land Commissioner, State land may be mapped–out by the Government Agent for any one or more of the following purposes;

(g) prevention of the erosion of the soil;

Section 156 In particular and without prejudice to the generality of the powers conferred by section 155, regulations may be made for and with respect to, all or any of the following matters:

(d) the maintenance of reserves for the preservation of the sources and courses of streams and for the prevention of erosion of the soil;

2. *STATE LANDS ORDINANCE NO.8 – 1947*

Section 49 Subject as hereinafter provided, the Minister may, by Notification published in the Gazette, declare that any state

land is constituted a State reservation for any one or more of the following public purposes:

(6) the prevention of the erosion of the soil;

3. *WATER RESOURCES BOARD ACT NO.29 – 1964*

Section 12 It shall be the duty of the Board to advise the Minister on the following matters, and on any other matters that are referred to the Board for advice by the Minster:

(d) the control of soil erosion.

4. *LAND GRANTS (SPECIAL PROVISIONS ACT) – 1979*

The Act provided for the transfer to the State land vested in the Land Reform Commission and the transfer of this vested land free of charge to landless persons. The transfers were subject to certain conditions, one of which was the stipulation that the transferee should carry out on his land, such soil conservation measures, which the District Secretary of the District may require from time to time.

5. *AGRARIAN SERVICES ACT NO.58 – 1979*

Section 34(2) The owner, cultivator or occupier of any agricultural land shall, in addition to such other duties as the Commissioner may in his discretion specify, ensure that:

(d) the land is properly maintained in order to ensure the maximum conservation of soil and water;

6. *MAHAWELI AUTHORITY OF SRI LANKA ACT NO.23 – 1979*

Section 13 Notwithstanding the provisions of any other law and without

prejudice to the generality of the powers conferred on the Authority by this Act, the Authority shall in or in relation to any Special Area have the power:

(3) to take such measures as may be necessary for water-shed management and control of soil erosion;

7. *NATIONAL ENVIRONMENT ACT NO.47 – 1980*

Section 22 The Authority in consultation with the Council shall, with the assistance of the Ministry charged with the subject of Soil Conservation, recommend soil conservation programmes including therein the identification and protection of critical watershed areas, encouragement of scientific farming techniques, physical and biological means of soil conservation, and short term and long term research and technology for effective soil conservation

(b). Prevention or Mitigation of Soil Erosion

Accelerating soil erosion and devastating earthslips in the hill country convinced the government that strong legislative measures would be required to address the problem of land degradation. An Act was therefore passed to make provision for the conservation of soil resources, for the prevention or mitigation of soil erosion and for the protection of land against damage by floods and droughts.

1. *1951 – SOIL CONSERVATION ACT*

The Act empowered the Director of Agriculture to undertake surveys and investigations to be made for the purposes of ascertaining the nature and extent of land degradation due to various factors including floods, droughts, salinization, desertification, siltation and soil erosion.

It also empowered the Minister to declare “erodible areas”, to specify measures regulating the use of land in such areas and to acquire land for carrying out measures to prevent erosion.

Several decades later the government realized that the provisions laid out in this Act were inadequate to meet present day demands for a number of reasons. The chief among these were;

(i) The identification of conservation activities as an extension function.
(ii) The implementation of the provisions of the Act and regulations could not be undertaken by normal extension staff of the Department of Agriculture as extension and regulatory functions are not compatible.
(iii) At the time the Act was enacted all land matters were handled by one Ministry. As time went on many Ministries and agencies were made responsible for the management of land. This prevented the Director of Agriculture from adequately exercising his authority and functions under the Act to the achieve the objectives of the Act.
(iv) The institutional support made available under the Act was considered inadequate.

2. 1996 - AMENDED SOIL CONSERVATION ACT

The deficiency is in the 1951 Act have been rectified in the Amended Act of 1996. There has also been a shift of focus from the control of soil erosion to land resource management.

4.2. FOREST RESOURCES

Nearly all the natural forest in the country covering approximately 20% of the land are belong to the state. They fall mainly within the jurisdiction of two institutions, the Forest Department and the Department of Wildlife Conservation. There institutions are guided by two legal enactments the Forest Ordinance and the Fauna and Flora Protection Ordinance.

1. *THE FOREST ORDINANCE OF – 1907 AND AMENDMENTS*

Most of the natural forest coming under the jurisdiction of the Forest Department are designated Reserve Forests or Proposed Reserve Forests and the ordinance has provision to protect these forests and their produce.

2. *THE FAUNA AND FLORA PROTECTION ORDINANCE OF 1937 AND SUBSEQUENT AMENDMENTS*

The ordinance provides for the protection of six categories of forests coming under the jurisdiction of the Department of Wildlife: strict natural reserves, national parks, nature reserves, jungle corridors, intermediate zones and sanctuaries.

4.3. IMPLEMENTATION OF LEGISLATION

The implementation of legislation has been hampered by several factors. The more important of these are:

1. Lack of implementation capacity and capability limitations in the areas of application.
2. The laws remain fragmented and scattered among several ministries, departments and statutory agencies.
3. Many acts reflect the major concerns that existed at the time of enactment. Hence they cannot be implemented because of developments that have taken place that were not anticipated at the time of enactment.
4. Most acts follow a regulatory approach. Provisions far promoting the participatory management of resources are lacking.

Recommendations:

1. Review the existing legislation pertaining to land degradation so that the short-comings and deficiencies can be eliminated and the laws made more effective and easier to co-ordinate.
2. The need to introduce new legislation to meet changing needs should be examined.

5. INTERNATIONAL ASSISTANCE RECEIVED FOR ADDRESSING LAND DEGRADATION ISSUES

The government has been able to mobilize and utilize a substantial volume of foreign assistance for the conservation and management of natural resources. The assistance has come in the form of loans, grants and technical assistance.

Between 1990 and 1999 approximately 35 projects have been commenced with foreign assistance to promote the conservation and management of natural resources. The principle sponsors have been the Governments of Japan, Germany, Netherlands, Norway, Denmark, United States, United Kingdom, The Asian Development Bank and the World Bank.

Of the 35 projects nearly half have focussed on the management of water and forest resources. The concern with these two resources has continued but in recent years there has been a widening of interests to cover other concerns such as Coast Conservation and Biodiversity Conservation. The recent concerns have also included the need to (a) encourage environmental activities at the grass roots level (b) protect critical watersheds and (c) develop appropriate institutional arrangements to integrate natural resource management into development programmes.

The widening of interests has been reflected in three new projects that have been started- The Environmental Action 1 Project (EA1P) 1997, financed by the World Bank and the Upper Watershed Management Project (UWMP) 1998 and the Sustainable Natural Resource Management Project(SNRMD)1999 financed by the Asian Development Bank. The EA1P and UWMP are financed through loans and the SNRMD through technical assistance. The total financial commitment for the three projects is in the region of 33 million U.S. Dollars.

Recommendations:

1. Avoid duplication of donor efforts.

2. In addition to addressing problems e.g. soil erosion, focus attention on the root causes of the problems e.g. land tennure.
3. Provide assistance to Provincial Councils and Pradeshiya Sabhas to undertake environmenal management.
4. Place greater emphasis on working with CBOs and NGOs.
5. Encourage the long term involvement of a donor agency in a particular sub sector.

6. PARTICIPATION OF LOCAL AUTHORITIES, NON GOVERNMENTAL ORGANIZATIONS, PRIVATE BUSINESS AND ACADEMIC INSTITUTIONS IN ADDRESSING LAND DEGRADATION ISSUES.

(a). LOCAL AUTHORITIES

There are 3 main local authorities in Sri Lanka- Municipal Councils, Urban Councils and Pradeshiya Sabhas. The urban areas come under the jurisdiction of the municipal Councils and Urban Councils and the rural areas under the jurisdiction of the Pradeshiya Sabhas. The Pradeshiya Sabhas are empowered to play a wide role relating to the conservation and improvement of the environment in their areas of authority under functions entrusted under Pradeshiya Sabha's Act and the functions entrusted by the Central Environmental Authority. The Pradeshiya Sabhas Act provides the Authority to prepare physical plans and thereby regulate land utilization and control the acts which cause harm to the environment. The Central Environmental Authority has delegated the responsibility for collecting environmental information, identifying main environmental problems within the area of authority and conducting training programmes on environmental matters.

Although the Pradeshiya Sabhas have been given a wide range of responsibilities they have been constrained in their activities by the shortage of financial resources and technical and staff facilities.

(b). NON GOVERNMENTAL ORGANIZATIONS(NGOS)

There are a large number of NGOs who's primary objective is the protection of the environment. Their main activities have included the raising of environmmental awareness among farmers and their children, soil conservation and the establishment of village plant nurseries and forestry demonstration plots. In addition to these activities they also play an important role in decision making through representation in state appointed committees and councils on various aspects of the environment.

The effectiveness of the NGOs has depended on the funding and the enthusiasm of their leaders. Although they perform a valuable role most NGOs are handicapped by limited resources and skills. Despite these limitations they have the unparalleled ability to reach out to people at the grass root level.

(c). PRIVATE BUSINESSES

Private sector involvement in addressing land degradations has been limited to a few companies engaged in agricultural production as one of their activities.

The leading private sector organization involved in soil conservation and reforestation activities is the Ceylon Tobacco Company which purchases tobacco from cultivators. The company provides financial assistance to farmers to adopt soil conservation measures on tobacco lands and develop fuel wood plantations on leased from the tobacco growers.

The plantations taken over by the government under the Land Reform Act several decades ago and managed by state agencies since then, have been recently handed over to private companies. These companies are now involved in soil conservation and in replanting activities on degraded lands coming under their jurisdiction.

(d). UNIVERSITIES

The universities are actively supporting government initiatives to address land degradation issues supported by both foreign funding and local funding. Several programmes on environmental subjects have been established and are now being implemented. These are at present five Master's Programme in environmental subjects at three Universities and degree programmes in four Universities in Environmental Economics, Environmental Science and Natural resources Management. These courses are considered to be more cost effective and more relevant than foreign courses. In addition to their teaching functions University staff in relevant departments also undertake research and supervise research being done by graduate students. They also provide advice to government agencies through membership in state appointed

committees and councils and do consultancy work for projects designed to combat land degradation issues.

Recommendations:

1. Promote the greater participation of Pradeshiya Sabhas in Combating Land Degradation.
2. Enhance the effectiveness of NGOs actively involved in Combating Land Degradation.
3. Develop the necessary policy, institutional and regulatory frame work to accommodate the private sector in Combating Land Degradation.
4. Provide the necessary financial resources to enable Universities to enhance their participation in Combating Land Degradation.

7. RECENT PROJECTS IMPLEMENTED TO COMBAT LAND DEGRADATION

A number of programmes pertaining to the sustainable management of land resources have been implemented within the last one and a half decades with donor assistance from both multi-lateral and bi-lateral agencies. The key programmes that have been undertaken are outlined below.

7.1 Re-forestation and Watershed Management Project (RWMP) – 1980

The re-forestation and watershed management project commenced in 1980 and was implemented by the Forest Department with financial and technical assistance from the United States Agency for International Development.

The purpose of the project was "To develop the institutional capacity of the Forest Department conserve and stabilize watershed areas in the highland regions and to enhanced the natural renewable and commercial resource base of Sri Lanka.

7.2 Community Forestry Project - 1982

The community forestry project commenced in 1982 and was executed by the Forest Department with financial and technical assistance from the Asian Development Bank. The main objective of the project was to supplement fuel wood supplies and to increase the supplies of poles, construction timber and edible fruits.

7.3 Land Use Planning Project – 1983

The Land Use Policy Planning Division, which was established in 1982 has been supported by two projects one from 1983 to 1987 and the other from 1987 to 1994. The first project which was provided with technical and financial assistance by FAO/UNDP initiated the land use planning process at the national level, while the second project which was provided with technical and financial assistance by the ADB helped in extending the process to the districts.

7.4 Upper Mahaweli Watershed Management Project (GTZ) - 1987

The objectives of the project was to "take necessary action to ensure ecologically acceptable management of the natural resources in the catchment areas of the Mahaweli River".

7.5 Forest Land Use Mapping Project – (FORLUMP) - 1989

The objective of FORLUMP was to assist the Mahaweli Authority of Sri Lanka in the collection of accurate information for watershed management. This was to be done through the production of maps for the Upper Mahaweli Catchment on the scale of 1 : 10,000 to serve as a basis for land use planing activities and forests.

7.6 Landslide Hazard Mapping Project – 1990

The main objective of the project was to regulate the development of housing and infrastructure on a sustainable basis in the districts of Badulla and Nuwara Eliya. The project was specifically designed to (a) provide landslide hazard assessment in the districts of Badulla and Nuwara Eliya, (b) ascertain socio-economic problems of re-settlement and (c) create an awareness among resident communities in hazards areas about the adverse impacts of improper land uses.

7.7 Shared Control of Natural Resources Project (SCOR) - 1992

The Shared Control of Natural Resources Project was designed to develop and test a holistic interdisciplinary approach to integrate conservation concerns with production goals.

7.8 Optimal Land Use in Sri Lanka with Particular Applications to Land Degradation and the Plantation Industries – 1994

The project had two major objectives:

(a) To formulate a set of policy proposals to facilitate the implementation of an improved pattern of land use and management within a framework that incorporates the main physical and economic interactions connected with land degradation in the hill country.

(b) To develop and apply models to determine patterns of agricultural lands use and management that will provide greater social benefit under the presence systems.

7.9 Environmental Action 1 Project - 1996

The primary objective of the project is to provide assistance to the government to the strengthen the institutional and policy framework for environmental management.

7.10 Upper Watershed Management Project – 1997

The Goal of the project is develop sound watershed management in the mid-south part of the hilly country through (a) improved conservation of natural forests (b) increased tree plantings by villagers farmers and plantations (c) improved land use practices on sloping lands (d) support for the adoption of soil an water conservation measures and the introduction of ecologically sustainable farming systems.

7.11. Integrated Rural Development Programs (IRDPs)

Programs to address land degradation issues have also been started by a number of integrated rural development projects. The main objective of these programs has been to prevent or reduce the degradation of land in critical areas and to elevate the income levels and living standards of the poorest communities in these areas depending on the land for their sustenance.

Recommendation:

1. Undertake an in-depth study of the projects implemented up to date to extract lessons from them, which could be used to address land degradation issues in the future.

8. EXPERIENCES IN COMBATING LAND DEGRADATION

The more important experiences gained through the projects implemented so far to combat land degradation are listed below.

1. The value of using watersheds, preferably, sub-watersheds or micro- catchments as areas of intervention.

2. The limited value of recommending a set of soil conservation measures to land users and providing them with incentives in the form of subsidies and cash payments . Such an approach has not been considered to be very successful because the subsidies (a) favored the more affluent farmers (b) increased the dependence of farmers on external agents and (c) made farmers to lose interest in conservation measures once the assistance was withdrawn.

3. The importance of promoting farmer participation through (a) programmes designed to make them aware of the consequences of increased land degradation and (b) training programmes designed to provide the required technical knowledge.

4. Several participatory approaches have been adopted in promoting the sustainable use of land and water resources. In some projects the beneficiaries have been involved in participatory analysis to asses current resource use and future implications and to formulate a future plan of action . In some the process has been extended to involve beneficiaries from the planning stage through implementation and final assessment. In other projects the beneficiaries have been given the entire responsibility for managing the land and water resources in their respective areas.

5. It has been found that, the strengthening of the implementing capacity of existing national and sub- national institutions should go in hand in hand with the building of local level and grassroots level institutions.

6. By and large land users have been encouraged to change their current land use practices mainly through the provision of incentives including material inputs, food grants, and subsidies. This type of assistance may not be forthcoming after the projects have been terminated. Ways to motivate land users in the absence of external assistance has to be investigated.

7. New land use systems and technological packages have been introduced. These are still in an experimental stage. Refinements and changes will have to be made in these systems before they can be replicated elsewhere.

8. In most projects appropriate technologies and land use systems have been tested, developed, and introduced to land users mainly with the intention of minimizing land degradation. The need to step up the productivity of agricultural lands in a sub-watershed for reasons other than land degradation has not been sufficiently stressed.

9. In most projects emphasis has been placed on the management of land resources. While the management of land resources may be important in steeply sloping areas where water is not a constraint on production, water management could assume greater importance in water-deficit areas.

10. Land degradation is certainly an important issue affecting the use of land, and merits the attention that it has received. However, there are other issues effecting the use of land that are perhaps of equal importance. In fact some of these issues, eg: insecure tenure, represent the underlying causes of land degradation. Such issues have not been considered adequately

11. Improved technologies have been transferred to beneficiaries both directly and indirectly. Direct transfers have been made either individually or through the formation of user groups. Indirect transfers have been in projects not directly involved in large scale field implementation.

12. The area of focus of the project has changed over time. In the early projects the focus was on the land and the interventions were designed to conserve and stabilize areas that had been degraded. In the later projects the emphasis has shifted from the land to the land users. The importance of focusing on land users rather on the land has been recognized.

13. To Combat Land Degradation there is a need to combine the transfer of technology to land users with the provision of required infrastructure and the building up of a data base has been recognized.

14. In Combating Land Degradation the importance of concentrating initially on the poorer segments of the farming population within the critical areas rather than on all the land users has been recognized.

9. MEASURES ADOPTED FOR LOCAL CAPACITY BUILDING

Many of the institutions concern with land degradation issues and activities have had inadequate capacity in the past to function effectively. Capacity has been inadequate in terms of human resources and also in terms of technical skills which often leads to a lowering of field level capacity. This in tern hampered the efforts of these institutions to contribute towards combating land degradation by reducing their ability to monitor and evaluate changes taking place on the land and to take appropriate corrective action on time.

Capacity building within these institutions has been undertaken in recent years;

(a) National and Sub National Level

(i) Expanding the agency cadres

(ii) Providing both local and foreign short term training

(iii) Providing funds and other assistance to technical staff to undertake post-graduate training both in Sri Lanka and abroad.

(iv) Organizing workshops/Seminars on subjects pertaining to the environment

(v) Conducting field programs to enhance knowledge and experince on environmental issues

(b) Local Level

(i) Conducting awareness creation programs for local level officers

(ii) Intensive training of field level technical staff

(iii) Training and mobilization land users for action

(iv) Organizing exhibitions and demonstrations

(v) Providing foreign assistance in the form of grants to NGO's and CBO's for environmental protection and development

Recommendations:

1. Government agencies engaged in conducting awareness creation programs and in training field level technical staff should be provided with the necessary human and financial resources to enable them to fulfil their roles effectively.

10. MONITORING AND EVALUATION

Monitoring and evaluation of field activities undertaken in regard to combating land degradation is being done by different agencies:

(i) Large projects (foreign funded)

Monitoring and evaluation programs have generally been included in the menu of activities.

(ii). Research Institutes

The different institutes monitor and evaluate soil conservation and other interventions being made in the areas in which they operate.

(iii). IRDP Programmes on controlling land degradation

Periodic internal assessments are carried out by the IRDP programmes that are being implemented in the different districts.

(iv). Agencies implementing land degradation programmes

Periodic assessments of projects being implemented by government agencies is often undertaken. These projects are generally evaluated once they are completed.

(v**). The Central Environmental Authority (CEA)**

The CEA when approving land based projects makes it mandatory on the part of persons and organizations commencing these projects to undertake periodic monitoring and evaluation.

Recommendations

1. The *Pradeshiya Sabhas* have the authority to establish committees on the environment. Steps should be taken to establish these committees. Once establish

they should be provided with the necessary capability to monitor and evaluate different programmes being undertaken within their areas of jurisdiction.

2. CBO's and NGO's should be involved in the monitoring of different programmes and projects within their areas of interest. They should also be provided with the necessary capability to undertake this task.

3. Research Institutes should expand their activities to assist in monitoring the activities of projects in "critical areas" related to their field of interest.

11. ADOPTED FINANCIAL MECHANISMS

The Government's financial resources come from Domestic Funds(government income); Foreign Aid Loans; Foreign Aid Grants; Reimbursable Foreign Aid Loans; Reimbursable Foreign Aid Grants and ; Counterpart Funds (for projects). The funds are allocated to each Ministry and the Ministry in turn allocates funds to the line departments and other agencies.

The relative importance of the above sources of funding varies with each Ministry. This can be seen from the following figures which indicate the relative share in 1999 of each source for four of the more important Ministries involved in combating land degradation;

Share of total allocation received in 1999

	Ministry of Forestry & Environment %	Ministry of Agriculture & Lands %	Ministry of Mahaweli Development %	Ministry of Irrigation & Power %
1. Domestic Funds	50.2	95.1	57.9	18.0
2. Foreign Aid Loans	7.4	3.1	11.5	79.0
3. Foreign Aid Grants	39.4	1.6	1.6	0.7
4. Reimbursable Foreign Aid Loans	2.6	-	23.8	1.3
5. Reimbursable Foreign Aid Grants	0.4	-	2.3	-
6. Counterpart Funds	-	0.2	2.9	1.0

Provincial Councils:

The main sources of funds at the provincial level are :

(1). Annual State Grant- This includes a Block Grant and a Criteria Based and Capital Grant . The latter Grant is made when the target expected from taxes is not reached.

(2). Provincial Specific Development Grant. This Grant which was earlier given toline Agencies is now given to the Provincial Council.

(3). Income derived from rents and taxes.

(4) Direct foreign assistance

In addition to the above sources development and environment based activities within the province are also implemented through the “Decentralized Budget”. These are monies given to Members of the National Parliament to enable them to undertake different activities in their respective electorates.

Pradeshiya Sabhas:

The funds for Pradeshiya Sabhas are obtained in two ways:

(1). Funds for the salaries of officials are provided by the Provincial Council within which the Pradeshiya Sabha falls.

(2) Funds for different activities undertaken within the area of jurisdiction are obtain from taxes and rents.

NGOs/CBOs:

Some of these organizations are funded by foreign governments or foreign institutions. Others generate their own funds locally.

Recommendation:

Pradeshiya Sabhas and many NGOs and CBOs suffer from a lack of funds. If they are expected to play a greater role in the sustainable management of the environment in the future, then steps should be taken to provide these organizations with the funds they require to discharge their responsibilities.