ENVIRONMENTAL MANAGEMENT IN ETHIOPIA:
Have the National Conservation Plans Worked?

Environmental Forum Publications Series No. 1

Shibru Tedla and Kifle Lemma

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Eastern and Southern Africa (OSSREA)

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1. INTRODUCTION

1.1 Brief Description of the Natural Environment of the Country

Environmental Baseline Data

Ethiopia, situated in the Horn of Africa, has a total land area of 1.126 million Km^2. Its population is estimated at 58 million with a density of more than 90 persons per Km^2 in the highlands and 10 persons per Km^2 in the lowlands.

Land Ecosystem

The main physical feature of the country is the diversity in altitude and accompanying climatic and ecological variations. The altitude ranges from 120 meters below to 4500 above sea level. The climate in the highlands (areas more than 1800 masl) is mild and the annual precipitation ranges from 800 to over 2200 mm. The lowlands are hot with annual rainfall varying from less than 200 mm to 800 mm. Of the total area 60 percent is reported to be suitable for agricultural purposes. The natural forest cover is 2.4 percent of the total area.

Water Ecosystem

Ethiopia has a large water resources potential which includes eleven major lakes with a total area of 7,400 Km^2, twelve river basins with a total annual surface runoff of about 110 billion m^3 and ground water with an estimated capacity of 2.56 billion m^3. Most of the rivers are transboundary with more than 75% of the annual surface run-off draining to neighbouring countries. The water resources provide large potential for hydro-power generation, irrigation and fisheries. Mineral resources such as soda ash are also extracted from lake brine. Water quality in urban areas is poor due to pollution from domestic and industrial wastes.

Main Non-renewable Resources

The main non-renewable resources, even though limited, are minerals of which gold, rare minerals like potash, platinum, marble, phosphates, high quality coal, shale oil and iron are important. Natural gas and hydrothermal potential are also substantial.

Biological Diversity and Renewable Resources

Ethiopia has a varied ecological setting, which has facilitated the evolution of various forms of life. As a result, Ethiopia is one of the twelve Vavilov centres

of primary plant domestication in the world. It has a very high genetic diversity in four of the world's widely grown food crops (wheat, barley, sorghum, peas), in three of the world's most important industrial crops (linseed, castor, and cotton), in the world's most important cash crop (coffee), in food crops of regional or local importance (teff, finger millet, etc.) and in forage plants of world importance (clovers, oats, etc.). Ethiopia has also a high level of endemicity in its wild flora and fauna (NCSS, 1994a).

Agriculture is the main economic activity, accounting for 45% of the GDP. The main products are teff, sorghum, barely, field peas, chick peas, niger seed, linseed, enset, cotton and coffee. Small-holder farming is predominant, accounting for more than 90% of agricultural area and 95% of total area under crop.

1.2 The Need for the Present Study

Ethiopia is a country where natural resource degradation has been going on for centuries. At the present time it is facing a serious ecological imbalance triggered mainly by the fast increment of its population size. This has led to a destructive cycle of land use pattern, involving deforestation followed by continuous cropping and grazing with little or no investment on the soil. This pattern leaves few opportunities for the natural vegetation to regenerate, making the land more susceptible to erosion, affecting the hydrological cycle and altering the regimes of the rivers. Changing this situation calls for better management of the natural resources including putting appropriate policies and regulations in place to facilitate better environmental management.

There is a need to appreciate the state of environmental management (mismanagement) in Ethiopia. This could be addressed through an in depth study of environmental management arrangements, in terms of existing institutions, laws and regulations that have impact on the environment as well as of policies and specific strategies formulated for the management of the environment. It is after the appreciation of the situation that gaps could be identified and subsequently addressed for the enhancement of environmental management capacity.

The main objective of the present study is, therefore, to see whether or not the conservation plans in Ethiopia have worked, and if not, to find out why they have not worked, by assessing the prevailing situation in environmental management and by identifying missing links in proper environmental management. The study will facilitate identification of issues for further study.

2. BACKGROUND

2.1 Global Overview

Relatively speaking the importance of natural resources management has acquired recognition only recently. Human kind has been using natural resources since his emergence as *Homo sapiens*. The impact of human activity on the natural resources surrounding human kind was initially insignificant or zero. Such impact became more and more conspicuous as the population expanded and also as new capacity and skill to manipulate natural processes increased. Throughout the millennia, human knowledge and technology have grown in leaps and bounds. Such growth, although slow initially (eg. change from Stone Age to the Iron Age), had quickened as time passed, the gaps in technological change (revolution) becoming shorter and shorter, and the rate of knowledge and skills acquisition growing faster and faster, respectively.

Despite this vast accumulation of knowledge and skills, it is only recently that a simple truth has become obvious, and that is: **unless natural resources of planet Earth are used sustainably, the continued survival of human kind on earth will be at stake.** There is no point in arguing about the reasons why it has taken so long for this truth to see the light of day. Whatever the reason for delays in response, there is now an urgent need to address environmental management.

What we have today is a world divided, roughly, into developed and developing. The developed part, comprising about 20% of the world's population is sustaining its life style by using 80% of the total resources utilised whereas the developing world, consisting of 80% of the world's population, consumes roughly only 20% of the same. Excessive consumption in the developed world is leading to very fast depletions in both renewable and non-renewable resources. Industrial and related pollution is a disease in the developed countries, causing air, water, and land pollution, poisoning these resources so much that their life support capacity is drastically diminishing. These facts are not reflected in the indicators we use to measure human well being such as education, health, shelter, among others. If they had been, the results would not have looked so good.

When we look at the developing countries, however, what we find is that there is a lack of well being both for humans and in the eco-system, and the situation is continuously getting worse. This is an indication that human knowledge and technology have not developed evenly in every society and, for some reason (whether historical or otherwise), have favoured the North rather than the South.

While developing countries were making an effort to bring about development following the unsustainable model of the North, the North was, at the same time, realising the unsustainability of its model of development and that catastrophe would certainly occur if the developing countries, in which 80% of the world's population reside, "successfully" reached the standard of "development" that exists in the North. There is no better expression for this concern than the statement "Imagine one billion Chinese driving automobiles!"

As a result, the concern for the proper management of natural resources became clearly visible in the 60's and gained momentum in the 70's. The concern at first was seen as a purely conservationist movement and later it was seen as an issue of development and sustained development at that. It reached global dimensions by 1972 when the Stockholm Conference on the Human Environment was held. By 1972 the purely conservationist movement, which was much more concerned with scenic resources and threatened wild animals, was on its way out. There is no more proof to that than Art. 21 of the Stockholm Declaration, which reaffirms the sovereign rights of states to develop and use their natural resources.

As the problems of developing countries, particularly the least developed countries, of which the majority are in Africa, became a subject of deliberation and study, the vicious circle of 'poverty-environmental degradation-poverty' became recognised. In other words, in developing countries people are more dependent on natural resources, particularly renewable natural resources, than people in developed countries, and this dependence leads to resource depletion and degradation. The depletion and degradation further intensifies poverty, leading to even more intensive depletion and degradation.

Environmental degradation and depletion occur mainly due to anthropogenic impacts. Pristine nature existed before human interference. Obviously, when human numbers were few their impact did not exceed the carrying capacity of the natural resource base. As human numbers increased, however, there were less and less natural resources to be utilised on a sustainable basis, and an over-exploitation and mining of resources had to occur in order to satisfy more and more people with less and less resources.

The causes for this state of affairs are many and complex. Initially, there was a general feeling that the problems would go away with the popularisation and application of technical solutions, concentrating on physical conservation activities only. It took some time before it was realised that the problem could not be solved with technical solutions alone. Deep-rooted social, cultural, historical economic and political factors had to be examined to discover their impact as exacerbating factors of the degradation-depletion syndrome. It is

such deep-rooted factors that have led to the insupportable situation that exists today in East Africa. The most important once among such deep-rooted factors are the following.

- the impact of colonisation;
- unfair international trade practices;
- centralised systems of government which have also frequently been dictatorial and undemocratic;
- ideological competition;
- inadequate technological development and disruption of existing indigenous systems, knowledge, and technology;
- disruption of indigenous institutions; and
- problems in the system of resource tenure and lack of access to land and other natural resources.

Obviously all these factors are contrary to the current development paradigm of "peoples empowerment". The concept of peoples empowerment has a number of interrelated aspects and components which must be present for real empowerment to exist. The most important of these components are:

- a decentralised administrative structure of state and government;
- devolved authority and responsibility;
- a democratic process of governance and democratic institutions;
- a participatory and transparent process.

If the validity of this new paradigm of development and its component parts are acceptable as indispensable for development, then the more the policies, strategies, action plans and, of course, legislation of government at all levels incorporate these basic concepts, the more can an effective development be brought about.

2.2 Environmental Initiatives at the Regional (Africa) Level

The world over, conservation now falls within proper environmental management. It is rare nowadays for people to raise issues of conservation independently of environmental management, and it is in line with this trend that we are discussing environmental management in lieu of conservation in this document.

In dealing with the environment there is a need to focus activities at the local, national and regional levels, so that a global perspective could emerge in a more realistic manner. It is because of global issues that arose as a result of environmental mismanagement that more attention is being paid to

environmental issues as a whole by international agencies as well as by the rich countries of the north.

The African continent is facing a series of interconnected economic and environmental challenges which, if not resolved, will disrupt the basic life support systems, contribute to the degradation of institutional structures and perpetuate underdevelopment.

Evidence from soil scientists, agronomists, meteorologists, and economists indicates that continued overuse of biological systems can set in motion changes that are self-reinforcing. Each stage of deterioration hastens the onset of the next. When destructive change is coupled with rapid population growth and subsistence economies, the stage for human tragedy is set.

Africa needs to address the problems associated with environmental mismanagement from many angles as outlined in the working documents of the 5th AMCEN (The African Ministerial Conference on the Environment) Session. AMCEN's working document addresses proper management of resources in all types of ecosystems including terrestrial ecosystems, freshwater, marine and coastal areas and urban settings. Major attention is given to human capacity building in areas such as environmental economics, accounting and management tools; environmental law, institutions and policies; environmental education and training; and environmental awareness and public information. Central to all these activities is the promotion of human welfare, environment and development. Managing demographic change and population pressures figures high in the list of priority actions (AMCEN, 1995; 1993).

AMCEN has also affirmed that it will address new and emerging issues such as intellectual property rights, national biodiversity strategies and action plans, biotechnology and biosafety so as to strengthen the African Perspective and Position, and that it will participate in global initiatives within the framework of the UN agenda for peace and development and the United Nations Conference on Environment and Development.

Recently AMCEN has decided to focus its activities on the following orientations: sensitisation and organisation, within available financial resources, of seminars and workshops on conventions; support to the drawing up of national action plans and national Agenda 21; support to the integration of environmental impact assessment in development projects; capacity building, environmental education and public awareness; and strengthening subregional cooperation in the area of the environment.

Time will show whether or not these envisaged activities will be implemented; and if implemented, what effect they will have on the overall improvement of environmental management in the Region.

2.3 Major Environmental Concerns at the National Level (Ethiopia)

All the activities perceived by AMCEN concern Ethiopia as well, as a member state. A closer look is required into the state of the environment in Ethiopia and the efforts that are being made to abate the prevailing environmental degradation process.

Major Environmental Issues in Ethiopia

Ecological Problems in Ethiopia

In Ethiopia the ecological crisis is deepening. It is deemed to be the result of misguided and unregulated modification of the Ethiopian environment, in particular the vegetation, soils and natural ecological processes. Increased human and animal population, whose livelihood is based on the use of natural resources, in particular renewable natural resources, has led to their fast depletion and serious degradation. Their exploitation has been and still is beyond their "self-replicating capacity". The use of unsustainable agricultural practices is also considered as one of the causes of this crisis.

Since the livelihood of 85% of the population is dependent on natural resources (particularly renewable natural resources), depletion and deterioration of these resources has resulted in reduced agricultural productivity and subsequently in reduced quality of life of the people. In addition, drought has become more frequent. Since 95 % of the cultivated land is under small-holder peasant agriculture (average 1.5 ha), it is the cumulative impact of the actions of these land users that has eventually led to the degradation and depletion of these resources. As a result forest and wood land and, generally, biomass cover is shrinking rapidly, so much so that out of the now remaining 2.4 % of high forest 45 % is facing pressure from ever-expanding agriculture.

It is not only the need for agricultural land leading to land clearing which contributes to land degradation, but also the reliance on biomass for fulfilling household energy requirements.

A 1984 estimate indicates that 94.8 % of total energy consumption in Ethiopia was made up of biomass fuels consisting of fuelwood, animal dung and crop residue. Fuel wood use makes up 81.8 % of these traditional sources, while animal dung and crop residue make up 9.4 and 8.4 %, respectively. Traditional

fuels make up 99.9% of rural energy consumption and the rural population consumes 86.7 % of total net energy (EFAP, 1993).

The highland areas of the country are where the largest number of livestock are found; they are also the areas which are heavily cultivated. The expansion of cultivated land has limited pasture-land; as a result there is an increased reliance on crop residues as animal fodder. According to one forecast, all pasture-land in these areas will be fully utilised by the year 2005 (Hurni, 1988).

The amount of food produced is so inadequate that it does not satisfy even the minimum calorie requirement per capita. For example, in 1988/89 production was only 151.1 kg/year/person, which is about 25 % percent below the minimum requirement. Figures for 1979 - 1983 indicate a sharp decline in grain production. This decline in productivity and the high level of population growth rate (3.1%) had forced the country to import 285,000 tons of grain per year between 1980-84. Major causes for this poor performance of the agricultural sector are recurrent droughts, civil war and wrong policies and priorities. This figure has become much higher in the 1990s.

Thus, land degradation is the major environmental problem in Ethiopia. Land degradation is expressed in many ways including soil removal by sheet and gully erosion, nutrient depletion by biomass burning including dung and crop residues resulting in a break of nutrient cycle. Dung and crop residues are used as sources of domestic fuel because of lack of wood.

Soil erosion is a phenomenon which occurs mainly in the highlands of Ethiopia. Here the surface is rugged, steep and deeply dissected, and slopes exceeding 15% are commonplace. In addition the rainfall is often torrential in many parts thus exacerbating erosion. More than 5000 years of land cultivation has taken its toll on the resources of Ethiopia causing extensive land degradation. Over this long period of cultivation the natural vegetation of the country has imperceptibly been eroded from North to South. Beginning around the end of the 19th century, renewable resources in the Central, Eastern and Southern parts of the country have been put under immense human pressure (FAO, 1986).

The major form of soil erosion is, thus, water induced. There is very little, if any, replenishment of soil nutrients taken by crops in the traditional agricultural system, thus resulting in loss of soil fertility. It is estimated that Ethiopia loses 400 tons/ha of top soil every year. The severity of the rate of soil erosion could have been limited had it not been for the serious deforestation and removal of biomass cover that have been occurring for centuries and which in turn have accelerated in the last 30 years. The latest land degradation estimates indicate that out of the 52 million ha. of land making up the highlands of Ethiopia, 14

million are severely degraded, 13 million ha. are moderately degraded and 2 million ha. have practically lost the minimum soil cover needed to produce crops (Hurni, 1988).

Other causes of degradation, particularly in areas of irrigated agriculture, are salinity and water logging. There is a need to improve irrigation practices, particularly in efficiency of water application to land, in order to reduce degradation of these resources. Salinity has put a significant area in the Awash Valley out of production.

The problem of land degradation in Ethiopia has been recognised for some time. It was estimated, in 1990, that, as a result of soil erosion, loss in grain production amounted to about 40,000 tonnes per annum. Unless this accelerated soil erosion is arrested, the loss could reach 170,000 tonnes by the year 2010.

Deforestation is a major issue in Ethiopia since it is one of the main causes of the prevailing land degradation. Tree cutting is a common occurrence which has been taking place over the centuries because of the need for more land for cultivation, for use as fuelwood, for production of charcoal and for construction purposes. A long time back in history some parts of Northern Ethiopia, which are today suffering from conditions caused by land degradation, were covered with forests (EFAP, 1991).

In addition to the deforestation caused by understandable needs, negligent as well as wanton destruction (such as by fire), contribute to deforestation. These types of deforestation have become increasingly frequent in the last 20 years or so. This has been a period in which security of land tenure and access to natural resources were undermined by unpopular policy measures such as frequent redistribution of land and restrictions in cutting and utilising trees, even in one's own backyard. Serious destruction of forests has occurred between the fall of the 'Derg' and the stabilisation of the present government (EFAP, 1993).

Forest and generally biomass degradation as well as consequent land degradation, lead to the destruction and erosion of biodiversity of both plants and animals. In the past, the focus of biodiversity conservation in Ethiopia was only on crop genetic resources. Animal diversity was completely neglected, while plant diversity was only of interest in as far as it related to crop genetic resource diversity.

More specifically, the destruction of habitats, the introduction of a narrow spectrum of crop varieties, recurring droughts as well as wars and conflicts could be mentioned as the most common causes of the erosion of biodiversity in Ethiopia. In view of the presently growing conflict between biodiversity

conservation and agricultural needs, there is a potential danger that conservation of biodiversity will lose. Ethiopia's largely poor rural population, driven by poverty, attempts to satisfy its survival needs through the clearing of more forest land for agricultural purposes.

The major environmental issues have been articulated by the National Conservation Strategy (NCSS, 1994a, 1994b, 1994c).

Population Growth and Distribution and its Impact on Natural Resources

The current (1996) population is estimated at 58 million, increasing at, 3.1% per annum; this rate is expected to increase to 3.6% by the second decade of the next century. Most of the population (88%) live in the highlands (above 1500 masl) which constitute only 43% of the country's land area. The land is approaching its carrying capacity limits based on prevailing agricultural practices. At the present rate of growth, a large part of the country will be unable to produce the food needs of its population. All the potential grazing land will be fully utilised by 2004 while all the potential cropland will be utilised by 2017 (Hurni, 1988).

The high population has caused the unsustainable use of soil, water and forest resources. The ever growing energy demand for domestic fuel has resulted in extensive use of crop residues and cow-dung for fuel. This practice breaches the nutrient cycle. Forest resources are also being depleted fast because of high demand for fuel wood and timber. More and more land is being deprived of its plant cover because of the ever increasing demand for crop land. The depletion of top soil has meant reduced water retention capacity of land, erosion of plant genetic resources and loss of habitat. At the current rate of population growth and resource utilisation, it is estimated that by 2010 three quarters of old '*awrajas*' similar to present day zones will be unable to meet their subsistence food needs. Deforestation has accelerated in recent years, especially in the last three decades, in response to a rapidly growing human population.

Crop and Animal Husbandry

A variety of crops and animals are well adapted to the varied and variable environmental conditions of Ethiopia, including tolerance to drought, waterlogging, low soil fertility, land and variable animal feed quality and quantity, and resistance and tolerance to diseases and pests. The tools and implements in use have been appropriately developed. However, these husbandry systems are under intense pressure from the increasing size of the human population, which has necessitated expansion of cropland and reduction

in grazing land. This has caused crowding of livestock and reduction of quality and quantity of feed and fodder.

Land degradation and the associated threats to the ecological support system underpinning agricultural production are the most serious environmental problem in Ethiopia. The introduction of crops with narrow genetic bases replacing the farmer's varieties has enhanced risk of loss of crops.

Soil erosion is a major environmental concern affecting 82% of the country. About 1.0 billion tons of top soil is eroded annually depleting the fertility of the land (UNDP, 1994). Natural factors such as ruggedness of the terrain and torrential nature of the rains have contributed to exacerbation of the problem. The extensive agricultural production system, the use of obsolete technology which is not environmentally friendly and overgrazing by the fast growing livestock population have also contributed to soil erosion.

Mismanagement of Resources

Ethiopia's forests are being destroyed at an alarming rate and the area covered by forests at present is only 2.4% compared to the estimated 40% initial coverage. The primary causes of natural forest destruction are agricultural expansion, both through shifting cultivation and the spread of sedentary agriculture, and the demand for increasing amounts of construction material, fuelwood and charcoal. Deforestation and poor land husbandry practices have resulted in accelerated run-off, reduction in the recharge of groundwater reserves, increased sediment load of rivers, siltation of reservoirs and increased incidence in the degree of flooding.

Drought, which has claimed the lives of millions of people and caused loss of millions of livestock, is another important environmental problem affecting 53% of the land area. Most of the highlands are highly degraded and, even in times of good rains, have not been food self-sufficient.

Malnutrition, lack of safe drinking water and poor environmental sanitation are major health concerns in Ethiopia. Health services are also limited and reach only 46% of the population. As a result infant mortality and overall death rate are high, while average life expectancy at birth is 47 years.

Efforts at expanding the infrastructural and industrial base of the country have had negative consequences on the environment. The expansion of irrigation schemes has led to the spread of vector-borne diseases and the displacement of small farming and pastoralist communities. The recent growth of urban areas and industrial establishments has caused the deterioration of the environment

through emission of wastes. Lack of urban planning, absence of legally enforceable effluent standards and weak city waste disposal systems have worsened the situation. The extensive road construction activities in rural Ethiopia have also contributed to soil erosion and loss of forest cover.

Biodiversity Conservation and Management

Unlike the resources in domesticated plants, the genetic resource of their wild relatives comprising genetic resources of medicinal plants, forest resources, microbial resources, naturally occurring plants and also wild animals have not been given sufficient attention and as a result there is continuous loss of biodiversity.

There are a number of protected areas (parks and sanctuaries) covering about 2.7% of the country, mainly focusing on larger fauna. However, these protected areas suffered severe damage during the war or during its immediate aftermath. The increasing demand for land is in conflict with biodiversity conservation.

Land Resource Use Policy and Land Use Planning

The absence of land use planning has often resulted in uncoordinated land development with conflicts among various government agencies. Living examples are the extraction of soda from Lake Abijata (protected area) and the development of a state coffee farm in Bebeka (a priority state forest area).

The absence of land use planning has become the root cause of conflict between government and peasants or pastoral people who traditionally depended on the land prior to such developments.

Lack of Participation in Resource Management

Absence of popular participation in resource management has resulted in the rejection of government policies formulated and implemented from the centre, policies such as collectivization, villagization, resettlement, campaigns for re-afforestation and soil conservation, and prohibition of tree cutting.

In addition, the state sector land development efforts have been made with little, if any, consideration for the traditional users of the land. Examples include delineation of national parks in areas traditionally used by pastoralists and/or agro-pastoralists; development of large fuelwood plantations in areas of mixed small-holder agriculture; large irrigation schemes in dry season grazing areas of pastoral people's livestock and development of state farms in areas of small-holder agriculture.

Natural Resource Tenure and Access Rights

The frequent reallocations of land by peasant associations all over Ethiopia during the past regime created a strong feeling of tenure insecurity among land users. Even when re-distribution was stopped, large areas of communal land were brought under cultivation by individuals who were either landless or took advantage of the situation and moved to acquire more land.

The old practice of considering woody plants open property resources for the taking by anyone has deterred peasants from planting trees. This has reduced security of tree tenure and exacerbated the deforestation of the country.

Absence of Environmental Economics

The normally quoted measure as a country's output, the Gross Domestic Product (GDP), does not account for the depletion of national assets, the country's natural capital such as soil, forests, water, minerals, etc. In the economic appraisal of development projects, the costs of environmental and natural resource benefits forgone as a result of the projects' activities are rarely included in the calculations. For example, the opportunities lost with the loss of biodiversity at Abijata, where soda extraction takes place, and the livestock production forgone as a result of irrigation in the Awash Valley are not considered in Ethiopia's developmental activities.

3. ETHIOPIA'S NATIONAL CONSERVATION PLANS

3.1 Evolution of Conservation Policies and Legislation

Since the Second World War, successive governments in Ethiopia have, with varying degrees of intensity, made attempts to address conservation issues. Initial concern was not direct, and emphasis was on economic growth and the potential immediate exploitability of the country's natural resources as a means of supporting rapid and increased economic growth. Gradually, however, recognition that the purely or mainly exploitative approach will lead to a dead end – ultimate depletion of the resource base which supports human life – has become increasingly appreciated, initially by those who were involved in the natural resources sector and later by a wider group involved in development planning. The period immediately before the Second World War and the historical period extending far back in time before that, however, are considered as the "dark ages" of conservation.