

THE INTERCONNECTEDNESS OF ENVIRONMENTAL MANAGEMENT AND SUSTAINABLE DEVELOPMENT

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Abstract

Sustained production of goods and services depends not just on the ability of factors of production but also on the quality of the environment and its natural resources. Thus, environmental management and economic development are intimately interconnected. However, environmental problems ranging from climatological change, soil degradation, destruction of biodiversity, over-exploitation of natural resources to lower standards of human settlements are most serious in Ethiopia. There is, therefore, a need to meaningfully manage the environment by way of taking synchronised policy and other supportive measures with the view to ensuring sustainability of socio-economic activity and development.

1. INTRODUCTION

Evidences suggest that sustained production of goods and services depends not just on the ability of factors of production but also on the quality of the environment and its natural resources. Thus, environmental management and economic development are intimately interconnected. The environment consists of intricate ecological systems. Trees and grass, for example, not only provide fuel and fodder, but also build soil fertility and prevent erosion, and ameliorate climate change. They also provide water catchment and wildlife habitats. These systems are the underpinnings of human welfare and survival, economic growth and development.

Environmental problems such as climatological change, soil degradation, destruction of biodiversity, over-exploitation of natural resources, and lower standards of human settlements are the most serious in Ethiopia. The root causes of these phenomena are population pressure in the face of poverty, the current patterns of human production and consumption, the fact that existing techniques are not satisfactorily coping with current levels of economic activity, and the adoption of environmentally harmful short-term strategies that rely heavily on intensive use of natural resources.



The existence of environmental problems are also symptoms of the lack of integration of environmental considerations in the formulation and implementation of economic policies, inadequacy of institutional and regulatory controls, limited environmental data and public awareness, and paucity of technical, human and financial resources to properly manage environmental concerns.

The objective of this paper is, therefore, to reflect the need to meaningfully manage the environment by way of taking synchronised policy and other supportive measures with the view of ensuring sustainability of socio-economic activity and development.

The paper attempts to address environmental management and sustainable development issues in five sections. Following the Introduction in section 1, the inter-relationships between environment and development are outlined in section 2. Section 3 is devoted to the treatment of the environmental implications of development trends in the context of the country to be followed by section 4 which is concerned with the definition of the needed measures that should be accorded priority in order to achieve an environmentally sustainable development path. The final section presents some brief conclusions.

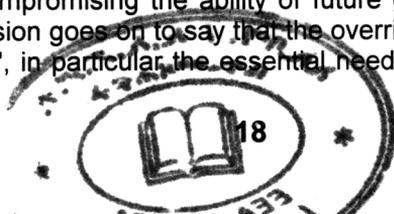
2. ECONOMIC DEVELOPMENT AND THE ENVIRONMENT: CONCEPTUAL FRAMEWORKS

2.1. Economic Development and Sustainable Development

The concept of sustainable development is a more comprehensive definition of the original concept of economic development in as much as it proposes a model of growth and human activity that explicitly includes environmental consideration and the idea of allocating and conserving resources over time and in a sustainable manner.

Originally, the concept of sustainable development was introduced by those supporting the view that environmental conservation and economic development and economic growth could be made compatible. A hallmark of most contemporary proponents of sustainable development is their emphasis on the need to conserve natural resources and natural environments as a means towards achieving their goals (Tisdell 1993). Many take the view that existing institutions, including market mechanisms, are likely, in the absence of pro-conservation directives, to conserve natural resources and environments inadequately, thereby contributing to non-sustainable development.

The World Commission on Environment and Development (1987) states that 'sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs'. The Commission goes on to say that the overriding priority should be given to the concept of 'needs', in particular the essential needs of the world's poor, and that



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full account should be taken of the influence of the state of the environment on the ability to meet present and future needs.

The World Conservation Strategy (IUCN 1980) also stressed the importance of sustainability of economic activity, and pointed out that if economic development is to be sustainable, continuing and proper attention must be paid to the biosphere and natural ecosystems within it.

Tietenberg (1988) claims that 'the sustainability criterion suggests that, at a minimum, future generations should be left no worse off than current generations'. In broad terms, this amounts to saying that the actions of present generations in using resources should not reduce the standard of living of future generations below that of present generations.

The UNDP model constitutes an integrated approach in which sustainable development is a function of both economic development and sound environmental management (UNDP 1992). Its final objectives are integrating environmental considerations into development plans, pursuit of sustainable development, economic development strategies compatible with environmental goals, and linking national objectives with environmental management activities.

2.2. Conservation of Natural Resources and Sustainable Development

Views about the importance of sustaining resource use in LDCs and the value of conservation to LDCs differ significantly. One view is that natural resource conservation is of very little value to LDCs and they would possibly be better off by sacrificing their natural resources to attain economic growth, or extend the period of their economic survival. The opposite point of this view is that, given the nature of the economies of many LDCs, the slim prospects of most for sustainable economic growth in the foreseeable future and the heavy dependence of their population on natural resources for their livelihood, conservation of natural resources should be a high priority for LDCs if they act in their own self-interest (Tisdell 1993).

In a related point, it is argued that the inhabitants of LDCs are much more dependent for their livelihood on living resources than those of developed countries. The bulk of the population of LDCs is typically employed in agriculture, fishing, forestry and other industries directly dependent on a living resource base (Todaro 1981). Disturbances to the ecosystems on which these industries depend can have widespread economic consequences. This is one reason why any developments in LDCs giving rise to ecological effects need careful assessment.

The main reason for conserving natural resources for future generations is that many resources are non-substitutable, or can be irreversibly lost. It is impossible, for example, to create a substitute for the carbon cycle or bring to life a species that has

become extinct. The facts of non-sustainability and irreversibility demand that people become more cautious about running down existing natural stocks.

3. DEVELOPMENT TRENDS AND ENVIRONMENTAL IMPLICATIONS IN THE COUNTRY-SETTING

The major environmental threats in the country can be broadly viewed from four dimensions, namely, soil erosion, deforestation, urban and industrial pollution, and poverty. The causes of soil erosion are slash and burn agriculture, deforestation, and farming on steep slopes. Deforestation is due to new settlements, expansion of cultivation, overgrazing, and fuelwood and construction material. Urban and industrial pollution is attributable to solid and liquid waste especially from rural-urban migration and extensive informal housing, an overall increase in human settlements, and industrial waste, particularly hazardous waste from existing industry. Poverty is due to skewed income distribution, high population growth, and poor access to education and gender disparities.

3.1. The Expansion of Agriculture

Agriculture is the main-stay of the Ethiopian economy. There is a growing body of evidence to suggest that the agricultural sector has set much of the foundation of the Ethiopian economy, and will continue to do so in the future. The question is whether and how the ecological costs may be reduced and the social and economic benefits may be sustained over time.

The areas of Ethiopia that receive sufficient rainfall and temperature have been under cultivation for about 8,000 years. A number of crops scarcely known elsewhere in the world are extensively cultivated. Crops are often grown on precipitous slopes with inadequate measures for soil conservation. These methods of cultivation, practised by a high and increasing population, have already ruined once fertile and productive areas, especially in the north and east. All other areas of the country are rapidly going the same way (EPA 1997).

Ecological and environmental problems that were not perceived in their full dimension have emerged in the country. This can be attributed to the rapid growth of agricultural activities in order to be able to feed the ever growing mouths to supply the agro-based industries with the needed raw materials, and to improve the foreign exchange earning capacity of the country through increased production of export crops.

Major developments in the agricultural sector are: crop production, irrigation development schemes, animal husbandry (such as poultry-rearing installations, cattle rearing, etc.) often involving the use of uncultivated land or semi-natural areas for intensive production. It is necessary to anticipate some of the potential environmental

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consequences of agricultural activities in order to incorporate some safeguards and/or mitigative measures.

Considering the predominant smallholder agriculture, it is true that some improvements have occurred in farming efficiency due to improved supply of production requisites, improved crop protection, marketing arrangements and infrastructure services. However, the conditions in the prevailing farming practices have led to over-exploitation and degradation of natural resources on which agriculture itself ultimately depends.

In Ethiopia, the problem of soil erosion is a major ecological catastrophe. It is severe, especially in the Ethiopian highlands which comprises about forty per cent of the total area of the country. Some studies show that accelerated soil erosion has caused a progressive annual loss in grain production of about 40,000 tons (MOA 1992). The same study indicates that some two million hectares of pasture land has been degraded by soil erosion between 1985 and 1995 with very significant impact on livestock development. The acceleration of soil erosion is the result of the increasing demand of the continuously growing human and animal population. When the soil loses its fertility farmers will not have enough harvest. They lack sufficient income to meet their needs. Poverty will reign over their life. There is a clear relation between poverty and environmental degradation. The poor are the victims and cause of environmental damage, since the ultimate question of the poor is to survive at any cost (MEDaC 1999).

Overintensified use of land particularly in the highlands of the country where the population density is high is causing erosion and deterioration of soils. Farmers increasingly clear steep slopes that should be kept under forest or perhaps tree crops. According to the Soil Conservation Research Project of 1981-84 that conducted research into the annual soil losses from five selected research sites in the highlands of Welo, Gojam, Shewa, Sidamo and Hararghe, the soil loss from these areas was between 0 and 300 metric tons per hectare with an average loss of about 72 tons per hectare. This is quite a substantial figure when compared with the tolerable level of only 6 tons/hectare/ year or 0.2 mm/year (Kirkby and Morgan 1980).

One of the main, perhaps the major cause for the already prevailing land degradation is deforestation for the purpose of getting arable land, for construction purposes, for fire-wood, charcoal, etc. These are major man-made activities that contribute to the dwindling of the country's natural forest cover and resources (MEDaC 2000). The Ethiopian Forestry Action Programme of 1994 estimated the full value of forest depletion in 1990 to have been about Birr 138 million.

It is argued that the combination of population pressure and unequal access to productive resources force an increasing number of people to overexploit marginally productive, fragile ecosystems (UNIDO 1992). Poor families cut whatever wood they can for essential fuel. The result is ever widening circles of bare and infertile soil

around settlements, ever more time and effort required simply to obtain fuel and raise enough crops to survive, and less time and energy to improve welfare. It has been indicated in the National Report on Environment and Development of 1992 that traditional fuels contribute 99.9 per cent of the rural energy consumption, with fuel wood being the most important source (81.8 per cent) followed by dung (9.4 per cent), crop residues (8.4 per cent) and a small amount of charcoal. Given high population increase, this condition has tended to put more and more pressure on the forest resources.

The spread of agriculture outside of traditional farming zones has also been, among other things, a major cause of deforestation. Where lands are suitable and proper technologies are available, forest clearance for farming is often desirable, so long as it is accompanied by watershed protection, preservation of natural areas and the enforcement of suitable land uses. But much of the deforestation has been on lands that are not suited for agriculture; valuable species, other resources and ecological functions can be destroyed without commensurate social benefits.

In the lowlands of the country where livestock resources are predominant, the spread of cultivation has squeezed herders into ever more restricted areas, thereby causing overgrazing. The most serious impact of overgrazing is indicated by reduced feed supply leading to the undernutrition and malnutrition of animals. As a consequence of overgrazing, the following environmental problems may occur: increased surface runoff, erosion in steep terrain, reduced ground water and reduced water flow in streams and rivers.

Although irrigated agriculture represents only 4.6 per cent of total cultivated area (Gizaw and Zekaria 1989), there is evidence to show that in some irrigated farms inadequate use of technology has caused serious environmental problems, such as leaching of chemical products, the salinisation of arable soil and water-borne diseases. A study conducted by the World Bank in 1993 shows that water logging and salinity have reduced yields of major crops by 30 per cent in Pakistan and Egypt and by about 20 per cent in India. The same study also reveals that in most of the Sub-Saharan African countries including Ethiopia, Kenya and Sudan, bilharzia infestation has increased among the population at risk at rates from less than 5 per cent to 10 per cent after the introduction of irrigation schemes. It must also be noted that several tropical and infectious diseases are carried by water and may be disseminated through irrigation and flood control systems (Barghouti and Moigne 1991).

3.2. Industrial Production

The country has been embarking on industrial development programmes as a way out of poverty. The existing distribution of industrial establishments is urban-centred and the industrial strategy is agro-based. These establishments are linked to the environment in several ways, such as through raw material utilisation, encouraging

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migration and in some instances of the country's conditions through the disposal of waste by such industries as cement, leather and chemical

It is worth-noting, however, that because of lower overall production and consumption levels, the cumulative effect of the industries on the environment is likely to be modest in the short-term. But, there is a need to discourage the widespread use of environmentally unsound production processes by employing appropriate technologies and promote environmental awareness in the long-run.

There have been no studies made in Ethiopia on the impact of industrial projects on the environment. Anticipation of potential environmental problems can, however, be made based on literature from other countries (EPA 1997)

The extraction of raw materials for the purpose of industrial development projects may have considerable environmental impacts on the natural resource base and the land and water associated with it. Industries using obsolete technologies and equipment; discharging wastewater; polluting air, soil and ground water; and producing effluent are environmentally damaging. Considering socio-economic impacts, population movement and demographic changes as a consequence of an industrial establishment may cause increased exploitation of natural resources in the places where new settlements emerge. As regards to industrial and occupational health and safety, accidents tend to occur due to equipment not functioning properly and possibly being damaged; there may be exposure to excessive amounts of noise, metals, chemicals, minerals and organic dust resulting in occupational hazards and undesirable environmental impacts.

3.3. Population and Urbanisation

Ethiopia is grappling with two major trends: explosive population growth and accelerating environmental degradation. Without a decline in fertility, population growth places an unmanageable burden on social services and puts pressure on the land that could only be relieved by large-scale migration. This causes mounting social and political tensions. It also implies continued rapid urbanisation and a burden that takes its toll on individual, household, and state savings. In general, unregulated population growth weakens national efforts to improve the quality of life and productivity of the population.

At the beginning of the 20th century, the estimated average annual rate of population growth was 0.2 per cent. This rate reached 2.92 per cent by the end of the 20th century (NOP 2000) If the recent projections of the Central Statistical Authority are borne out, the population of Ethiopia will increase from its present level of 62 million persons to 129 million persons by the year 2030 (CSA 1999) The latest estimates and projections of the United Nations 1998 revision also show that the population of Ethiopia is projected to rise and reach 128 million by the year 2030 (UN 1998). Such a major demographic change creates an imbalance between people, resources,

environment and development. In this connection, it is emphasised that population pressures should be relieved so as to achieve an equitable balance between population and resources for sustainable environment, population growth and development (UNECA 1992).

To meet the food requirements of such a growing population more production is required which, in turn, demands more land. However, it is a known fact that land size is limited. Therefore, under the increasing competition for space to find arable land to grow crops, farming goes beyond the usual limit. To get out of the land puzzle, farmers are involved in ecologically unfriendly activities like setting fire on forested land to expand their agricultural land. Such actions cause the loss of a multitude of biological species (plant and animals), thereby disturbing the harmony that could exist between man and nature (MEDaC 2000).

Growing population has also raised the demand for fuelwood for energy, and the resulting deforestation has increased runoff and erosion, lowered ground water levels, and further reduced rainfall especially in the arid areas of the country. It is estimated that out of the 40 per cent original forest cover in the country (FAO 1981), there had been a dramatic cut back resulting in a forest cover of 16 per cent in 1954 and only 4 per cent in 1975 (Hedberg 1979). Equally distressing is the issue regarding the destruction of the flora and fauna whose implication for medicine, genetic engineering and other productive activities cannot be disregarded.

The population implication for the environment can also be treated from two points of views, namely, the progressive urban concentration of people and the unequal spatial distribution of both natural resources and economic activities.

The population of Ethiopia in aggregate remained predominantly rural. As of 1984, 11.5 per cent (4.5 million) of the population lived in urban areas. By 1994, 13.8 per cent (7.3 million) had become urban dwellers. It is expected that 14.7 per cent, a total of 9.1 million, resided in urban areas of Ethiopia in 1999. Projections reveal that 23 per cent (29.7 million) of the population will be urban dwellers by 2030 (NOP 2000). This suggests that there is a gradual development in the urbanisation process in the country. Such a demographic change has been caused largely by rural-urban drift on account of the heavy concentration of economic activities in the latter. Uncontrolled migrations, often in response to degraded environmental conditions, have themselves damaged the environment. Rural exodus to the cities augments urban pollution, waste generation and overcrowding.

4. TOWARDS AN ENVIRONMENTALLY SUSTAINABLE DEVELOPMENT: POLICY TOOLS AND STRATEGIES

Given potential environmental opportunities, consideration should be given to the following issues in the endeavour to achieve an environmentally sustainable development path.

- Governments should consider environmental concerns to be an integral part of economic policy. With this in mind, the environmental impact of current and planned policies should be reviewed, taking into account present and expected development patterns.
- Various implementation mechanisms can be instrumental in making environmental policies effective, such as (UNEP 1988):
 - ethical persuasion, which seeks to alter the preferences of producers and consumers so that environmental impacts are taken into account in private decisions;
 - direct (legal) regulations which involve the use of laws, licenses, permits, registrations and directives to regulate and enforce actions to protect the environment; and
 - economic incentives, which seek to correct specific deficiencies in the allocation mechanisms of the private market system.
- There is a need to put in place an appropriate environmental management system. This is achieved when resources are used efficiently for the benefit of human development and when they are conserved because of their important ecological role in sustaining ecosystems.
- The deficiencies in the ability of the current national accounting framework should be corrected to take natural resources and the environment into account.
- It is important that when public projects are evaluated (and the same is also true of private projects that come under public scrutiny) their environmental impacts should also be considered..
- Earlier approaches to environmental management were based on environmental impact assessments of individual projects, and investment in programmes such as afforestation and water management. These are useful but inadequate. The project-by-project approach tends to address the symptoms rather than the root causes of environmental problems. Future strategies should look beyond projects to the broader issues, explicitly recognising inter-sectoral linkages and inter-generational concerns.

- It is in the interest of industry to protect, conserve and manage the environment. Appropriate environmental management in this sector would entail a "cradle to grave" approach (UNIDO, 1991), in which all steps of manufacturing a product are taken into consideration instead of focusing only on controlling emissions and effluents at the last stage. The adoption of this approach opens many economic opportunities to the manufacturing sector. There is also a need for stringent inspection and enforcement of factories to ensure worker's health. The private sector should also be assisted in establishing environmental standards for manufacturing.
- Demographic and environmental policies should not be defined in isolation, but in relation to each other and in the overall context of social and economic development. Population policies aiming only or primarily to reduce fertility will not suffice. It is important to consider the environmental and socio-economic characteristics of the population in order to protect the environment (Barbier 1992). Sustainable management of population distribution requires strategies in which the social and economic factors that determine growth and distribution are examined within specific contexts of development and resource availability.
- Coping with environmental degradation in urban areas will require policies and activities that emphasise: incorporating environmental planning and management techniques into city-wide strategic planning and implementation; facilitating the participation of the private sector; extending waste collection services into low-income areas using affordable approaches; formulating a migration policy to reduce urban drift, etc.
- A strategy for an environmentally sustainable development will also require other supporting instruments such as improved statistical data, improved sectoral and spatial planning, and public information and education.
- The institutions which are directly or indirectly responsible for environmental issues have inadequate resources and skills, little co-ordination amongst them, and no enforcement capacity. It must be noted that even if excellent environmental laws exist and regulations and economic incentives are in place, it is only with the presence and assistance of appropriate environmental institutions that any management programme can succeed. In this context, it is desirable to build the capacity of the Environmental Protection Authority and the Ethiopian Investment Authority should also be assisted in identifying least polluting, most appropriate environmental and economical industries for foreign investment.
- There are strong links between the concept of basic needs and the environment. Environmental degradation is often caused by a lack of adequate development. Many people in poor societies destroy their natural stock, such as forest resources, due to poverty and a lack of alternatives for supplying food, shelter and energy. Solutions to these problems necessitate eliminating the root causes of poverty.

5. CONCLUDING REMARKS

The achievement of economic growth and development in Ethiopia requires integrating environmental management requirements into the definition and implementation of economic policies, the proper management of the flow of scarce resources between various uses and alteration of societal production and consumption behavioural patterns by adopting a strategy for human resource development that provides for unrestricted access to basic education and to a generalised awareness of environmental problems.

There is also a need to solve the serious imbalance caused by situations of extreme poverty and socio-economic inequity in endeavouring to move towards an environmentally sustainable development path. Thus, resuming economic growth and effecting a meaningful income distribution would likely be one solution to the existing environmental problems in the country. This has, however, to be accompanied by measures aimed at the strengthening of the technical and organisational capacity of institutions responsible for environmental issues.

The present environmental challenges also require the strengthening of the planning capacity in order to promote structural changes in the economy. Specific policies should be adopted to regional features and to the prior promotion of employment generating activities incorporating technologies that maximise the use of local resources.

In general, the attainment of an environmentally sustainable development calls for an effective approach embodying considerable political commitment and a need to focus on the principal agents and activities which damage the environment and deplete natural resources. It also requires a harmonious and balanced development of economic activities through the integration of environmental protection requirements into the definition and implementation of other policies.

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