

Course title: Environment and Development

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Course objectives

At the end of the semester students would be able to: • Define natural resources, classify them and explain their role in human civilization; explain natural resources endowment of Ethiopia, and their development opportunity

- Describe and explain population, environment, development and the interrelationship between them
- understand the concept of sustainable development
- Explain how human action can develop resource and how human intervention may accelerate resource degradations
- Recognize the impact of unsustainable economic development and utilization
- Show how various biophysical resources affect the social economic and cultural development of a population

Course description:

This course is designed to make students acquaint with the meaning and link between population, environment and development; classification of natural resources based on different approaches and natural resources basis of Ethiopia.

Human population-natural resources dilemma: Malthusian and Bosrup theories; Kuznets curve and other theories of sustainable development will be explored. And, it also deals with environmental changes introduced due to miss consumption of resources as well as its impact on society and the environment.

Chapters and Topics

Chapter 1. Introduction

- 1.1 The link b/n population and environment

Chapter Two: Classification of natural resources

- 2.1 Basis for classification
 - 2.1.1 Based on origin (biotic and abiotic)
 - 2.1.2 Based on stage of development
 - 2.1.3 Based on renewability

Chapter three: Natural resources basis of Ethiopia

- 3.1 Climate
- 3.2 Water and drainage basin
- 3.3 Forest and tree species
- 3.4 Wildlife and parks
- 3.5 Mineral resources and soils

Chapter four: Population demography

- 4.1 Historical perspective of population demography
- 4.2 Demographic variables
 - 4.2.1 Total population increase
 - 4.2.2 Natural and migratory increase
 - 4.2.3 Population structure

- 4.2.4 population pyramids
- 4.3 Demographic transition

Chapter five: Theory of population growth and the environment

- 5.1 Population growth as an issue
- 5.2 Framing the debate
 - 5.2.1 Malthusian theory
 - 5.2.2 Bousrup's theory
- 5.3 Poverty and population growth
 - 5.3.1 Poverty
 - 5.3.2 Poverty versus population growth
- 5.4 Population and economic growth
- 5.5 Economic development
 - 5.5.1 Basic concept of development
 - 5.5.2 Sustainable development
 - 5.5.3 Challenges to sustainable development
- 5.6 Population, environment and development; the link
 - 5.6.1 Down word spiral hypothesis
 - 5.6.2 The Kuznets curve
 - 5.6.3 Beckerman hypothesis
 - 5.6.4 Porter hypothesis

Chapter six: Human activities and Environmental change

- 6.1 Why the environment change
- 6.2 Impact of environmental change
- 6.3 Consequences of human induced environmental change
 - 6.3.1 Land degradation
 - 6.3.2 Land degradation and food insecurity
- 6.4 Relationships between environment and poverty
 - 6.4.1 Environment-poverty-environment nexus
 - 6.4.2 Environment-poverty myths

Chapter 1

1.1 Population and Environment

For thousands of years, agriculture has been the activity most essential to human survival and well-being. In many parts of the world, however, it is not fulfilling its vital function of feeding people, providing other basic commodities and generating stable income. Rapid population growth and accelerated urbanization have created a pressing need for more and more agricultural outputs. By the year 2025, an estimated 57 percent of the populations of developing countries are expected to live in urban areas, compared with 44 percent at present. Accelerated demand for agricultural products has exerted ever-increasing pressures on the natural resource base, resulting in excessive deforestation, loss of biological diversity, degradation of soils and various forms of pollution and contamination.

Urban population growth puts great pressure on the natural resource base. To feed the ever increasing population without further degradation of the environment, food production should be intensified by using resources more efficiently and in a sustainable way. Ecological, economic and social imbalances not only affect the present generation but are also a threat to those of the future. Bearing in mind the expected role of agriculture in society and in the economy as a whole, the relationship between agriculture and the environment must be reconsidered so that this vital activity can be maintained on a sustainable basis. The lifestyles of the rich, with their excessive claims on global resources, will have to

be modified, while the living conditions of the poor, which compel them to endanger the natural resource base to meet their needs, will have to be improved.

1.2 Need for public awareness for environmental protection

We are facing various environmental challenges. It is essential to get the country acquainted with these challenges so that their acts may be eco-friendly. It is essential to make the public aware of the formidable consequences of the Environmental Degradation, if not retorted and reformative measures undertaken, would result in the extinction of life. Some of these challenges are as under:

Growing Population

Population puts considerable pressure on its natural resources and reduces the gains of development. Hence, the greatest challenge is to limit the population growth.

Poverty

The poverty and environmental degradation have a nexus between them. The vast majority of our people are directly dependent on the nature resources of the country for their basic needs of food, fuel shelter and fodder. Majority of Ethiopia people are still below the poverty line. Environment degradation has adversely affected the poor who depend upon the resources of their immediate surroundings.

Agricultural Growth

The people must be acquainted with the methods to sustain and increase agricultural growth with damaging the environment. High yielding varieties have caused soil salinity and damage to physical structure of soil.

Need to Ground water

It is essential of rationalizing the use of groundwater. Factors like community wastes, industrial effluents and chemical fertilizers and pesticides have polluted our surface water and affected quality of the groundwater. It is essential to restore the water quality of our rivers and other water bodies such as lakes is an important challenge.

Development and Forests

Forests in Ethiopia have been shrinking for several centuries owing to pressures of agriculture and other uses. The tribal communities inhabiting forests respects the trees and birds and animal that gives them sustenance. We must recognise the role of these people in restoring and conserving forests. The modern knowledge and skills of the forest institutes should be integrated with the traditional knowledge and experience of the local communities.

Degradation of Land

Water and wind erosion causes further degradation of vast area of land and it has to be avoided.

Reduction of Genetic Diversity

Proper measures to conserve genetic diversity need to be taken. At present most wild genetic stocks have been disappearing from nature. Wild fauna and flora are facing problem of loss of genetic diversity. Protected areas like sanctuaries, national parks, biosphere reserves are isolating populations. So, they are decreasing changes of one group breeding with another. Remedial steps are to be taken to check decreasing genetic diversity.

Air and water Pollution

In developing countries, the majority of industrial plants are using outdated and population technologies and makeshift facilities devoid of any provision of treating their wastes. A great number of cities and industrial areas that have been identified as the worst in terms of air and water pollution. Acts are

enforced in the country, but their implement is not so easy. The reason is their implementation needs great resources, technical expertise, political and social will. Again the people are to be made aware of these rules. Their support is indispensable to implement these rules.

1.3 Population

A population is a group of inter-acting individuals, usually of the same species, in a definable space. In this way we can speak of population of human on a country, and the population of fishes in a pond. A balance between two aspects determines the size of a population of any given species, based on its reproductive potential, and its environmental resistance. In this way population size is determined by the relative number of organisms added to or removed from the group as under:

- (i) Addition: recruitment into the population is a function of birth rate and immigration rate.
- (ii) Removal: loss from the population is a function of death rate and emigration.

1.3.1 Factors regulating population

There are a number of factors that regulates population size:

- (i) Physical attributes of the environment (e.g. climate),
- (ii) Food (quantity and quality),
- (iii) Disease (host-parasite relationships),
- (iv) Predation, and
- (v) Competition (inter-specific and intra-specific).

An ecosystem contains numerous populations of different species of plants, animals and microbes; all of them interact with one another as a community and with the physical environment as well. A community or biotic community, thus, consists of the population of plants and animals living together in a particular place.

1.2 Environmental management

In order to ensure environ tally sound environment, sustainability should be address not only at project level but also during policy formulation, programming and planning. Since human resource development is a prerequisite for sustainable development, it need special attention and addressed through environmental education and training activities and networking arrangements. Training of target groups is necessary through land-use and soil fertility projects as well as through crop, grassland, forestry and gender-oriented projects. These are often complemented by awareness-raising seminars and environmentally-focused workshops.

1.2.1 Sustainable production

If, to be sustainable, developmental activities must meet the challenges of food security, provide more employment and better incomes and contribute to the eradication of poverty, while at the same time conserving natural resources and protecting the environment, then the status and role of farmers in our societies must be commensurate with these responsibilities. The terms of trade between the agricultural sector on the one hand, and industry and the tertiary sectors on the other, should better reflect the services rendered by development operations to the general public. Similarly, the terms of trade between agricultural producers and those who process, market and consume agricultural products - urban dwellers in particular must be changed to take better account of the cost to farmers and other rural people of natural resource conservation and environmental protection. Furthermore, North-South and East-West

adjustments in commodity prices should be effected in such a way as to enable workers like farmers to make a sustainable living from developmental activities such as agriculture without being forced to cause further environmental degradation and depletion of the resource base.

More than 90 percent of the World rural households involved in agricultural production are situated in developing countries. These farm households are the principal decision-makers with regard to the use of crop and grazing land for food production, water for irrigation, energy for farm operations, and trees for fuelwood and construction. In the overall management of their production systems, farmers employ a complex mixture of traditional and new practices, the latter acquired through contacts with government research and extension services, international organizations and NGOs, and the private sector. Encouraged or discouraged by government policies and regulations, market conditions and price signals, farmers are making short- and long-term management decisions on crops to be grown, livestock to be kept, technologies to be adopted and investments to be made.

During the past three decades, production practices and systems have undergone profound changes, spurred on by the rapid increase in food demand, rural and urban population growth and technological change. While most production systems, ranging from shifting cultivation and pastoral systems to crop-based or mixed crop/livestock systems, are inherently sound and sustainable on an individual basis, their rapid multiplication and intensification may impose stress on the wider agro-ecosystem in which they are situated. An understanding of complex production systems in relation to farm-household-environment relationships in areas with different resource endowments and agro-ecological conditions is important in the planning of sustainable development.

1.2.2 Policy framework

For sustainable development, environmental policies are implemented, for e.g. at local, regional and national environmental action plan. Land development projects such as irrigation projects need to be supported by legislation. In sound development (that addresses sufficiently environmental development), it is necessary to outline the policy environment relevant to the project and, understand results in the light of prevailing policies. Legal and policy issues have far-reaching consequences for the environment and it is important to illustrate the complex nature of environmental issues. Sometimes, policies and regulations are conflicting and this can contribute to degradation. Environmental analyses has to highlight such conflicts and in depth descriptions of the consequences from the project under study need to be done. For instance, a policy for subsidize agro-chemicals to increase visa-vis an environmental policy to limit the availability of persistent chemicals are contradictory. Another example is using free irrigation water leading to water depletion and conflicts between head and tail water (also resulting in waterlogging and salinity problems. Such problems create problems and poses risk to future generations.

1.2.3 Social context

Social structures including cultural practices, institutional structures and legal arrangements, may diversify with in a country, from region to region, and among countries. It is, therefore, important to understand the social structure of an area, as it will have a direct impact on the project and EIA. The links among local, regional and national regulations, laws and organizations needs to be explicitly understood to the success of EIA. The recommendation from the EIA may include restructuring or strengthening institutions, particularly at a local level, for e.g., ensuring effective monitoring of drain water quality or

new legal to limit, for instance stipulating a particular flow regime in order to maintain a wetland. Participation of direct beneficiaries, mainly farmers, and local groups is essential to successful EIA. District council may play a role to achieve this and at the district level there is more interaction between sectors. Consultation with local interest groups, such as non-governmental organizations (NGOs) is useful to know local concerns. An awareness of the problems from social and cultural aspects help to find conflicts to be solved before project implementation.

1.2.4 The legal framework

Sustainable development and environmental protection need to be supported by appropriate legislation. Countries need to be equipped with a legal and institutional framework that responds to the goals of sustainable production system (e.g. agriculture, forestry and fisheries). The legal framework need to include legal advisory services, agricultural planning assistance, assessment and planning of natural resources development and protection, conservation and rehabilitation.

Chapter Two: Classification of natural resources