

# Chapter one

## Introduction

### 1.1 The Subject Matter of Natural Resource and Environmental Economics

The subject has two parts

- i. Natural Resource economics
- ii. Environmental Economics

Although they are a very close concepts, narrowly defined they are distinct disciplines.

The main concern of natural resource economics is

- The allocation of resources in the present as well as in the future
- ✓ This is called inter temporal allocation
- Distribution of outcomes of resource allocation decision

What are natural resources?

- Are those things available to man as gifts of nature.
- Can be living and non-living things endowed by earth.
- Should be currently being exploited or potentially can be exploited by human being as a source of food, raw materials, or energy.

Classifications of resources

Natural resources can broadly classified in to two

- i. Non-renewable natural resources
  - These are depletable /exhaustible/stocks
  - Their supply cannot be increased ; i.e., once extracted and used, there is no means of augmenting them ( at least in the short run
  - e.g. Oil, Nutrients, Metals, Clays, etc.
- ii. Renewable natural resources
  - These are non depletable /non exhaustive /flows
  - Their supply can be increased/ decreased with time
  - e.g. Forest, Wildlife, Rainfall, Solar energy, etc.

Environmental Economics, on the other hand, is concerned with two aspects:

- Regulation of pollution activities
- Valuation of environmental activities

[For an economist, the interest is to attach economic value to the positive and negative aspects of the environment. Positive amenities are fresh air, food, clothing, water, etc. Negative amenities are carbon dioxide, pollutions, etc.]

**Summary:**

Narrowly defined, Environmental Economics is distinct from its sister discipline, Natural Resource Economics.

In their narrow sense,

- Environmental Economics is concerned with
    - Welfare Economics
    - The Economics of Pollution
    - Valuation Theory
    - Environmental Policies
- } Brown Issues

Natural resource economics is concerned with the optimal utilization of natural resource [ Green Issues]

Broadly defined, environmental Economics is concerned with both green and brown issues. Hence, in the broad sense, Environmental Economics is not distinct from its sister discipline, Natural Resource Economics.

**1.2 Economic Activity and the Environment**

In economics the environment is viewed as a composite asset that provides a variety of services. The environment has four functions to the economy.

**1. Source of energy and raw materials**

It provides the economy with raw materials, which are transformed in to consumer products by the production process and energy which fuels this transformation

## 2. Sink of wastes /residuals/ of production & consumption

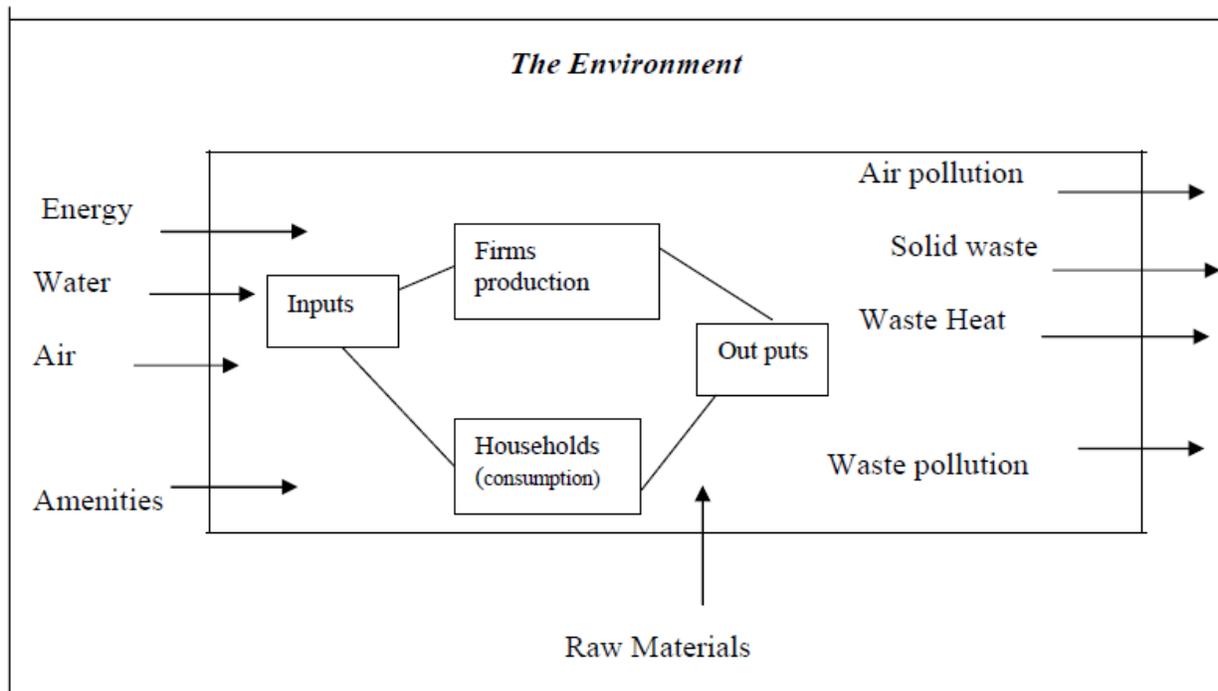
The raw materials and energy used in the production process return to the environment as waste products.

## 3. Serve as a life support to sustain human life

The environment provides services directly to consumers. The air we breathe, the nourishment we receive from food and drink, the protection we derive from shelter and clothing are all benefits we receive directly or indirectly from the environment.

## 4. It provides aesthetic values. (As a recreational asset.)

The environment provides us with a variety of amenities for which no substitute exists.



The knowledge of the relationship between the environment and the economy help us to design an appropriate policy that prevent undue depreciation of the value of this special asset (the environment) so that it may continue to provide aesthetic and life sustaining services.

### 1.3 The prospects

#### The basic pessimist model:

This is the outcome of an ambitious study published in 1992 under title “Beyond the limit of Growth”. The objective of the study was to stimulate likely future outcomes of the world economy (Based on the technique known as system dynamics (a large scale computer model was also used).

Three main conclusions were reached by this study,

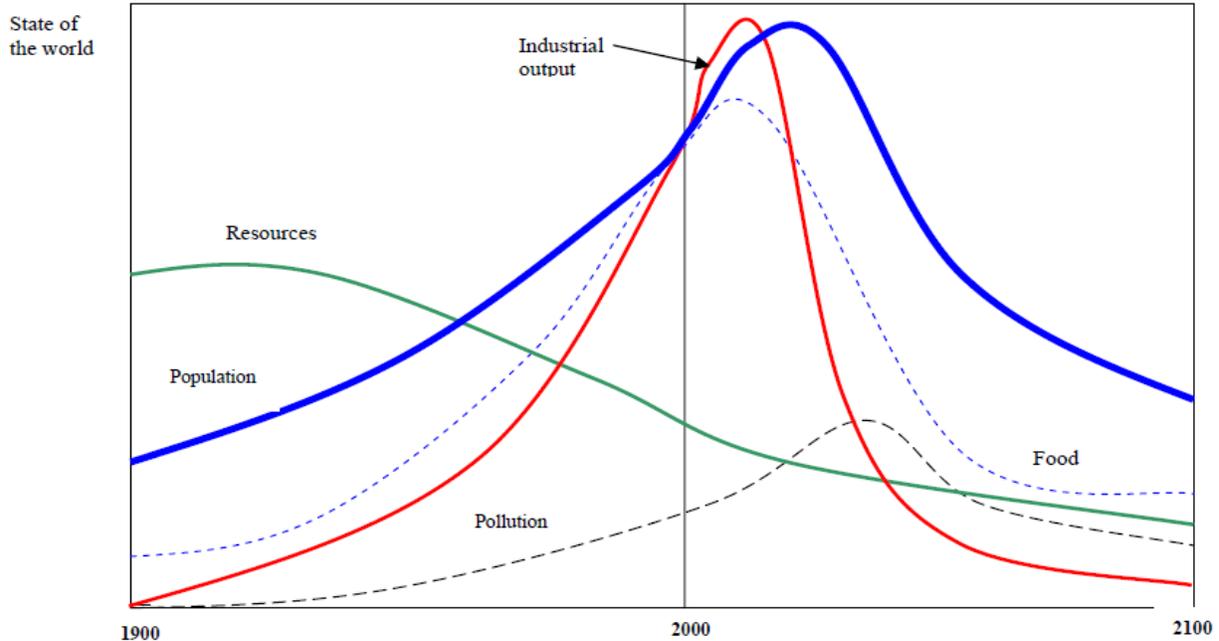
- i. Within a time span of less than 100 years with no major changes in physical, economic or social relationships that have traditionally governed world development, society will run out of the non-renewable resources on which the industrial base depends. Results:
  - collapse of the economic system
  - massive unemployment
  - decreased food production
  - decline in population as death rate soars
- ii. A piecemeal approach to solving the individual problems will not be successful. I.e. the removal of one limit merely causes the system to bump subsequently into another one, usually with more dire consequences.

E.g. when resources are doubled, the collapse still occurs but due to excessive pollution aggravated by increased pace of industrialization. When these two problems are jointly solved, population would grow unabated, and the availability of food would become the binding constraint.

- iii. Overshoot and collapse can be avoided only by an immediate limit on population and pollution, as well as cessation of economic growth. The portrait pointed shows only two possible outcomes: the termination of growth by self restraint and conscious policy- an approach that avoids the collapse or the termination of growth by collision with the natural limits, resulting in societal collapse.

Thus according to this study one way or the other growth will cease. The only issue is whether the conditions under which it will cease will be congenial or hostile.

### *Beyond the Limit standard run*



#### **The basic optimist model**

Is the portrait of the world economy presented by “Beyond the Limits” accurate? Many think not. An alternative vision, published by Julian Simon under the title “The Unlimited Resource” rejects the overshoot and collapse scenario in favor of a more optimistic vision.

#### **The conclusion of the model:**

The world has experienced a simultaneous increase in income, population, living standards and less severe shortage, lower cost and increased availability of resources. And there is no reason why these trends towards a better life, and towards lower prices for raw materials should not continue indefinitely.

We have seen two rather different visions—one optimistic and one pessimistic. In part the difference between them depends on how human behavior is perceived.

- If intensifying pressure on the environment results in a behavioral response which intensifies the pressure, pessimism is justified.
- If on the other hand, the human response either currently reduces those pressures or could be reformed so as to reduce those pressures, then optimism may be justified.