

## Chapter 4

### Environmental Issues and Sustainable Development

#### 4.0 Introduction

When examining the geological history of the Earth, it is clear that the world is over populated today. In fulfilling the basic needs of this population at present a vast amount of environmental resources are consumed and vast amounts of waste matter are released to the environment than ever before. This has given rise to various environmental problems. These problems have often turned out to be factors that lead to the destruction of future man kind as well as the entire environment. Hence it is essential that natural resources are utilized effectively, and that the future generation is endowed a pleasant environment where environmental problems are minimized and the environmental equilibrium is preserved. This situation is well explained through the concept of sustainable development.

The aim of this chapter is to identify the environmental issues and to explain the way to gift the future generation a pleasant environment where environmental problems are minimized through the concept of sustainable development.

We, the citizens of a country desiring to reach the development targets through developmental activities such as rural development, urbanization and industrialization should be concerned about the environment.

The following is a charming scene of Horton plains which is considered as one place where environmental pollution is minimal in Sri Lanka.

Fig 4.1  
A charming scene from  
Horton plains



## Definition of Environment

The Environment is our living surroundings. In order to understand what is meant by 'Environment', we may examine the "Definitions" that have been put forward about 'Environment'.

(a) 'Environment' covers the physical, chemical and biological situations that exist around a living being. (The Dictionary of Environment)

(b) The region beyond which a being lives or his surrounding is his 'Environment'. (The Dictionary of Technical Terms of Environment)

(c) We are part of the earth and it is part of us. The perfumed flowers are our sisters; the deer, the horse, the great eagle, these are our brothers; the rocky crests, the juices in the meadows, the body heat of the pony, and man, all belong to the same family." (Seattle's Statement 1954)

Taking all the above definitions and ideas into consideration, we can devise a simple general definition of 'Environment' as the "surroundings of any animate being or an inanimate object."

## The Main Components of the Environment

The components that have made up the environment can be divided into two main categories. They are,

- (a) Physical or inanimate components  
Soil, water, air, solar power etc. belong to this category. They are inanimate or non living components.
- (b) Living Environment or animate components  
All herbivorous, decomposers and carnivorous beings including human as well as flora belong to this category. In short all fauna and flora come under this category.

## Relationship among the main components of the environment

Environment is a blending together or merger of several components. Humans, animals, plants, sources of power and all other living beings and non living animate and inanimate objects belong to the environment. All these components have varying and complex inter-relationships. Such relationships are essential for the survival of the environment. Diagram 4.2 shows this inter-relationship.

In order to obtain all the requirements such as food, water, air, nutrients and energy for humans and animals for their survival, the inter-relationships that exist in the environment should function smoothly.

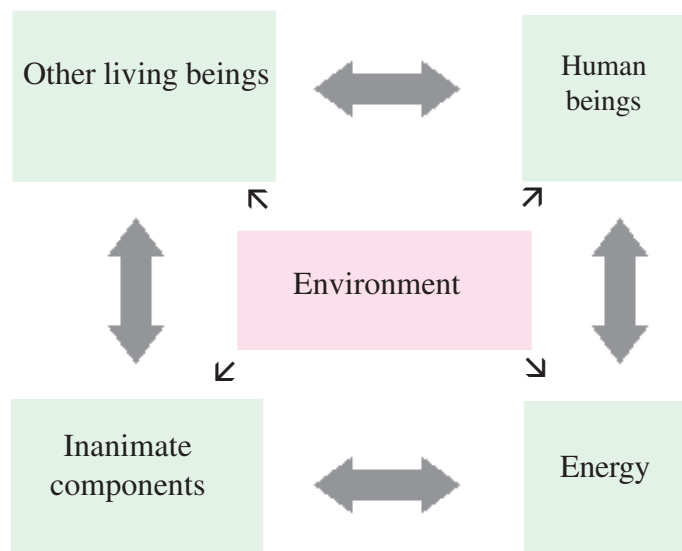


Diagram 4.2

## Man and Environment

Man who evolved as a part of nature, obtained from the environment at first only what he needed for his survival. Also he released to the environment only the refuse that were not harmful to it. However, as a result of the development achieved,

using machinery, chemicals etc, discovered with man's technological advancement during the last two hundred years or so, various adverse effects have set into the environment. All these in general can be called as environmental problems. An examination of the environment and human activities will reveal how these problems have become a threat to the survival of man as well as the environment.

Several rapid changes that have occurred with the spread of the discoveries of modern science throughout the world can be identified. The following areas are significant among them.

01. Rapid population growth
02. Industrialization
03. Urbanization
04. Massive utilization of natural resources.

According to economic criteria there is a tendency to forge ahead towards development through the aspects of industrialization and urbanization. However, a critical examination of the unforeseen natural disasters man has been experiencing during the last few decades, clearly shows that we have attained a situation of development devoid of an environmental balance. Hence, it is necessary to subject the relationship that exists between man and environment to a thorough screening and monitor human activities for the proper functioning of the environment. Towards this, there appears to be a need of the developmental approaches that would pay more attention to the environment.

## Environmental Problems

Environmental issues can be recognized as the harmful conditions caused by breaking the balance of the environment due to man's influence or natural phenomena.

Environmental Problems can be grouped according to the geo-spatial systems that include the hydrosphere, atmosphere, biosphere and lithosphere. Accordingly water pollution, air pollution, reduction of bio-diversity and earthquakes can be identified as environmental issues emanating from each of those spatial

systems. Further, environmental problems can also be grouped according to the sources of such problems. They are two main categories as,

01. The environmental problems initiated by man

02. The environmental problems associated with natural phenomena.

Accordingly, we can identify the environmental problems associated with the addition of carbon dioxide to the atmosphere as those caused by man's intervention, and catastrophes such as Tsunami disaster associated with oceanic earthquakes as natural environmental problems. However, there appears to be an inter relationship among the environmental problems that can be classified in various ways in this manner. In this chapter attention will not be paid to a classification of environmental problems, and it is hoped only to discuss a few major environmental problems. Through this discussion it is expected to focus on environmental problems and their inter-relationships, as well as on how these problems influence man and on the role man can play in controlling such environmental problems.

Among the environmental problems that have commanded much focus currently, the following are foremost.

- ◆ Air Pollution
- ◆ Water Pollution
- ◆ Depletion of biological resources
  - ◆ Destruction of natural forests
  - ◆ Depletion of wet lands
  - ◆ Destruction of coral reefs
  - ◆ Destruction of mangroves
  - ◆ Reduction of bio-diversity
- ◆ Heating up of the atmosphere
- ◆ Climatic changes
- ◆ Thinning of the ozone layer

- ◆ Acid rains
- ◆ Environmental health threats

Detailed information about the above mentioned environmental problems will be discussed later.

### Activities - 4.1



01. Indicate the main components of the environment and describe them.
02. State your ideas on the importance of the maintenance of the environmental balance of Sri Lanka as a developing country.

## Air Pollution

A substantial change in the general composition of the atmosphere can in simple terms be called air pollution. Pollution of air leads either directly or indirectly to various environmental, social and economic problems. The general composition of the atmosphere is indicated in table 4.1

Composition of the atmosphere (%)

Type of gas	Percentage
Nitrogen	78.03
Oxygen	20.99
Argon	0.90
Carbon dioxide	0.03
Others	0.05

Table 4.1

Among the other types of gases, Neon, Helium, Methane, Krypton, Hydrogen, Nitrous Oxide and Xenon are important.

It has been established by various researches that changes in the composition of different types of gases in the atmosphere have been caused by man's activities.

Air pollution occurs when the air around us is contaminated by other poisonous or harmful gases or matter mixed with it. Here the problem is the instances of such matter added to the atmosphere in over concentrated form in certain areas. In such a situation the organisms that live in those areas as well as plants and animals and the buildings become subjected to harmful influences.

Various experiments show the change in the composition of these caused by human influences.

### **Main causes of air pollution**

Air pollution can be divided into two types according to how it occurs, as

- (a) Natural causes
- (b) Man made or artificial causes

#### **Natural causes**

The ingress of pollutants into the atmosphere through natural phenomena such as the explosion of volcanoes, occurrence forest fires and dust storms are known as the natural causes of air pollution. Air gets polluted through the ingress of Sulphur dioxide ( $\text{SO}_2$ ) and dust due to the explosion of volcanoes and mainly carbon dioxide ( $\text{CO}_2$ ) due to the occurrence of forest fires and dust by storms in deserts. The ability to control the natural air pollution is less.

#### **Man - made (artificial ) causes**

All the causes of air pollution occurring due to human activities can be included under man made or artificial causes of air pollution. Foremost among the activities of man is the pollution of air caused through factories and vehicles. Such air pollutants are concentrated more in populous (congested), industrial and urban areas.

## Harmful results caused by air pollution

1. Damaging the ozone layer.
2. Ultraviolet rays reaching the earth's crust.
3. Heating up of the atmosphere.
4. Occurrence of acid rains.
5. Increasing of clouds that prevent the falling of sun's rays on to the earth's crust.
6. Occurrence of respiratory disease.
7. Occurrence of skin cancer.
8. Reduction in bio diversity and bio generation.
9. Rising of the sea level.
10. Occurrence of climatic changes.

### Activities - 4.2



Write an essay on the topic " My contribution for a world devoid of air pollution for a pleasant tomorrow".

## Water Pollution

Water pollution can be defined in simple terms as the change in the quality of water or the change in the physical chemical and biological characteristics of water.

Water pollution can be described further as a situation where an oppressive harmful or dangerous effect is caused to public health or security through water to which certain types of industrial refuse or sewage or any other material gases, liquid or solid waste is released.



## Sources of water pollution

The factors affecting water pollution or sources of water pollution can be divided into two main categories. They are,

- (a) Sources of water pollution associated with land
- (b) Sources of water pollution associated with oceans

### Sources of water pollution associated with land

Due to releasing of waste water from houses, factories, and business places, usage of chemicals for agricultural purposes, and many other ways of adding waste to water cause the pollution of water in fountains, canals, streams rivers and lakes which are water resources related to land.

### Sources of water pollution associated with oceans

Several factors have caused the pollution or contamination of water in the major oceans and seas of the world. They are called the sources of pollution of oceanic water. The following are such major sources.

- \* Flowing of petroleum into the ocean/sea (Eg. burnt oil released from ships, leakages of oil, seeping of oil from oil pipelines, destruction of oil cargo ships)
- \* Addition of plastic and such other solid waste matter in to the sea. (maritime industries, people engaged in such industries as well as tourists, releasing of plastic waste matter into the coastal zones).
- \* Contamination of the oceanic zone due to the release of waste matter from the fishing industry (eg. nylon nets, plastic bags and cans)
- \* Atomic tests conducted in close proximity to the oceanic zone.

## Problems created by water pollution

Several problems are created by water pollution. Following are a few of them.

- \* Contraction of various diseases and deformities resulting from the use of polluted or contaminated water.
- \* Death and destruction caused to the living organisms in rivers, lakes and oceans due to water pollution.
- \* Destruction of the plant community.
- \* Owing to the collection of deposits of various harmful matter in the filthy or polluted water in rivers and lagoons, growth in abundance of aquatic plants such as algae and cyanobacteria and salvinia.
- \* Humans contracting diseases by taking fish living in contaminated water, for food.

### Activities - 4.3



01. Briefly state what is meant by "water pollution."
02. Write an essay on the topic "Let us prevent water pollution to ensure a healthy life."

## Depletion of Biological Resources

All the plants and living beings including humans found in the environment can be defined in simple terms as biological resources. The components of these organisms can be of varying sizes and they may thrive in water, land or may be amphibian. The destruction caused both quantitatively and qualitatively to these organisms of various types is generally described as the depletion of biological resources.

The following matters are discussed under the depletion of biological resources,

- ◆ Destruction of natural forests
- ◆ Depletion of wetlands
- ◆ Reduction ( lessening ) of bio-diversity
- ◆ Destruction of the Mangrove system
- ◆ Destruction of coral reefs
- ◆ Destruction of oceanic resources

The species of living organisms that exist on the earth today are the result of a continuous process of evolution that started about three and half billion years ago, that is, from the time of the appearance of life on earth. When one species of organisms vanishes, we will have lost forever, the sources that provided us continuously the things and information coming down through a period of over three and a half billion years. It can not be restored. The species of organism living today are the heritage of all human kind living over millions of years. Hence it is the responsibility of the world community to assure the conservation of Bio- diversity on earth.

Just as the plant, the animal population too is subject to destruction and depletion. Certain animal species have disappeared fast. The horse, buck and camel of the United States have already become extinct there. There is also a dwindling of the tiger population of the world.

Here a problem arises whether the earth can survive with man and only the other organisms that are helpful to him. All these beings should exist for the functioning of food chains within the food production process and as the functioning of the various levels of the food web. Similarly, if one takes into consideration a pyramid built of various food levels, all the organisms covering the entire biosphere are seen to belong to a specific level of the food pyramid. Thus the extinction or depletion of various biological species is a serious environmental problem that would curtail the natural sustenance of the world.

# Sustainable Development

## Introduction

Most countries in the world have developed economically. The courses of action followed towards this, amount of natural resources utilized, and the waste released to the environment, have created various environmental problems. This has caused a reduction in bio-production and bio-diversity, as well as a creation of various social, economic and cultural problems. Hence, the need for an approach towards development while maintaining the environmental balance, had been identified from 1950's itself. This broad approach can be described in simple terms as "sustainable development".

Just like the developed countries, developing countries too have prepared the plans necessary for an approach towards an economic development of a higher level. Before long the world community realized that they are being subjected to the severe depletion of the environment resulting in the onset of environmental problems. Thus by 1976, the idea that the development of a country should take a sustainable developmental approach, became widespread. The United Nations International Commission on Environment and Development drew the attention of the world community to this idea at the Earth Summit held in Rio de Janeiro in 1992. Most nations in the modern world are currently in the process of planning a pleasant environment devoid of conflicts. It is clear that they are resorting to the sustainable development approach towards this. In this chapter the concepts of development and sustainable development will be examined.

## Development

Several definitions have been presented to explain the concept on 'development'. These definitions appear to be changing from time to time. Some such definitions are given below.

1. Development is “the enhancement of the standard of living of world population”  
(1960-1970 First Development Decade – United Nation Organization)

2. “If the poverty of a nation ends, employment opportunities increase and the inequality in the distribution of income is eliminated, it is development”  
(Dudley Sears)

3. Along with the economic development of a country, there should be a social development too. Social development should occur with the provision of food and nutrition, health, education, housing, social security, clothing, leisure and human freedom”  
(UNESCO declaration 1978)

4. Development is a process of change and growth including population, social, cultural and moral factors too”  
(Third Development Decade – 1981-1990  
United Nations Organization)

- The foremost objective of development is the enhancement of the quality of the living standard of the people of a country. Accordingly the favourable changes and growth that occur in any country or society can be defined as development. This growth can be considered through the economic social and cultural aspects.

**Quality of the standard of living :** Man achieving an advancement in the physical mental, social, cultural and spiritual aspects can be stated as a development in the quality of the standard of living.

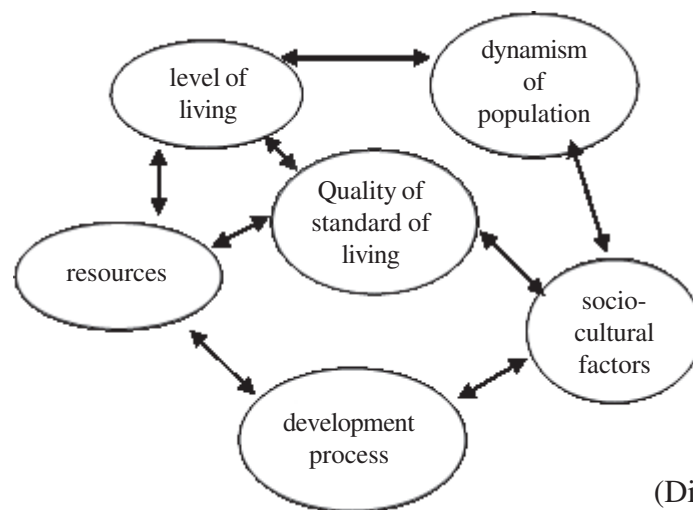
The development of quality in the standard of living is influenced by the growth of various measurable aspects such as food, housing, employment, sources of income, health, nutrition, education and the utilization of resources as well as the growth of immeasurable human qualities such as compassion, kindness, altruism, selflessness and human freedom.

From this, it is clear that in the enhancement of the quality in the standard of living, there are several aspects on which attention has to be focused. They can be stated under 5 heads namely.

1. Level of living
2. Socio-cultural factors
3. Resources
4. Dynamism of population
5. Development process.

The interaction of these factors affect the determination of the quality of the standard of living of a particular country/society (diagram 4.10.1)

#### Factors effectively to qualitative development of living standards



(Diagram 4.10.1)

### Measuring Development

In order to determine whether a country is at a high or low level of development relative to other countries, its development should be measured. There is a large number of development criteria widely used for this purpose.

## Objectives of measuring development

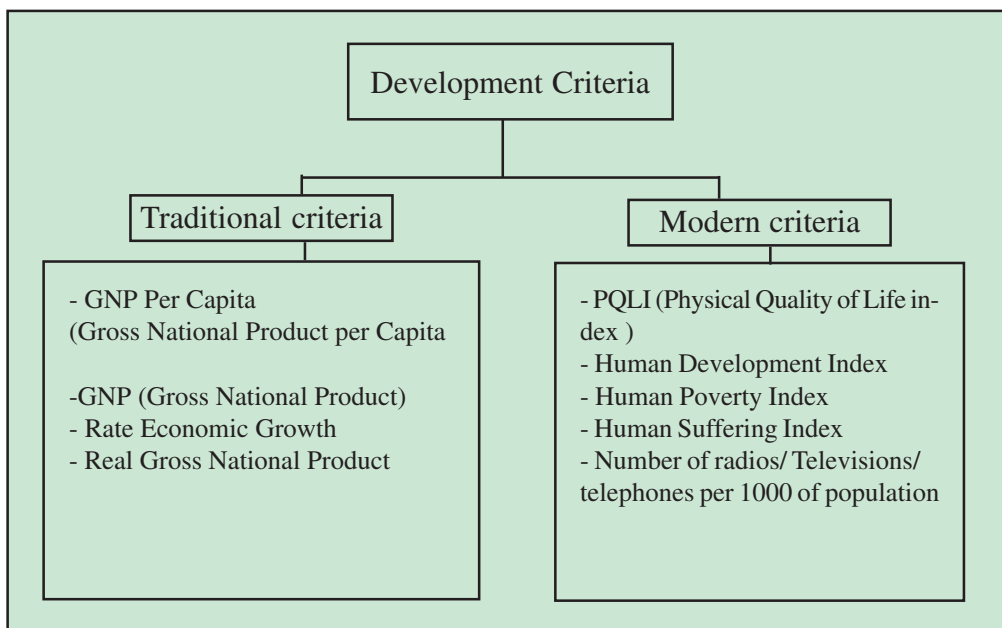
- Identify the variations in development
- Identity the socio-economic problems prevalent in the country.
- Employing strategies to march towards development overcoming these problems.
- Comparison with the development in other countries.

## Development Criteria

The criteria used to measure development can be divided into two main categories:

1. Traditional criteria
2. Modern criteria

The criteria employed to measure economic advancement are known as traditional criteria while those employed to measure social development are known as modern criteria.



## Gross National Product (GNP)

This is the value of all goods and services produced by a country per year including overseas transactions.

Gross National Product	GNP + Gross Domestic Product + Net factor
	(GDP)
	Income
	from
	Abroad
	(NFIA)

The chart 4.2 shows the Gross National Product for the year 2005

### Gross National Product - 2005

Sector	Value (Rs. in million)
<b>Agriculture</b>	179,278
Agriculture	148,712
Forestry	17,400
Fishing	13,166
<b>Industry</b>	280,868
Mining and quarrying	19,334
Manufacturing	169,336
Electricity and water	17,784
Construction	74,414
<b>Services</b>	579,618
Wholesale and retail trade and hotels and restaurants	225,103
Transports, storage and communication	159,484
Financial services, real estate and business services	122,127
Public administration, other government services and defence and other community, social and personal services	72,903
Gross Domestic Product	1,039,763
Net Factor Income from abroad	-16,526
Gross National Product	1,023,237

Chart 4.2  
Central Bank of Sri Lanka Annual Report -2006



Gross National Product of a few countries are given below:

### Gross National Product of a few countries-2004

Country	Value in US \$
United State of America	12,168.5
Japan	4,734.3
India	673.2
South Africa	165.3
Iran	155.3
Sri Lanka	19.3

Chart 4.3

Source: World Development Report – 2007)

### Gross National Product per Capita (GNP Per Capita)

GNP per capita (Gross National Product per capita) is obtained by dividing the Gross National Product (GNP) by the Mid-Year Population of the relevant year. This is also known as the Gross National Product per person.

$$\text{GNP Per Capita} = \frac{\text{Gross National Product}}{\text{Mid year population}}$$

Chart 4.4 shows GNP per capita of a few countries

### GNP Per Capita 2006

Country	Value US\$
United State of America	41,410
Japan	37,050
South Africa	3,630
Iran	2,320
Sri Lanka	1,010
India	620

Chart 4.4

Source: World Bank Report - 2006

## **Physical Quality of Life Index (PQLI)**

This was introduced by the United Nations Organization in 1977. This is made up of three components namely

- Literacy
- Life expectancy at birth
- Infant mortality rate

The value obtained for the Human Development Index ranges from 0.000 to 1.000. This index gives an idea of the country's social and cultural aspects. Information about the nutritional and health facilities in the country are revealed by life expectancy at birth and by infant motility rate, while literacy shows its educational advancement. This is considered as a complementary factor when measuring development.

## **Human Development Index**

This was introduced by the United Nations Development Programe in 1990. This index is a relative measurement to measure man's development. Here three factors are considered basically.

1. Literacy
2. Life expectancy at birth
3. Purchasing power

The value obtained for the Human Development Index ranges from 0.000 to 1.000

Countries are categorized based on the Human Development Factor as follows;

1. Countries with high Human Development Factor - above 0.800
2. Countries with average Human Development Factor - 0.500 - 0.799
3. Countries with low Human Development Factor- 0.000 - 0.499

The values of Human Development Index for a few countries is given below:

Country	Value
Sweden	0.951
Canada	0.950
Japan	0.949
Sri Lanka	0.755
India	0.611
Bangladesh	0.530
Niger	0.311

Chart 4.6  
Source: World Development Report - 2007

In countries where the index shows a low value, the level of living of the people is low, while in countries where it takes a high value the people's level of living too stands at a high level. United Nation's Development Programme has named that the most suitable criteria for measuring development is the Human Development Index.

## Human Poverty Index

Human Poverty Index tries to measure the amount and spread of poverty in a country. This comprises two factors.

### 1. Human Poverty Index (for developing countries)

Components:

- Life expectancy below 40 years.
- Drinking water facilities.
- Health facilities.
- Percentage of low-weight children below 5 years.

## Human Poverty Index (In developing countries)

Country	Value (%)
Venezuela	8.5%
Sri Lanka	18.2%
India	31.4%
Bangladesh	42.2%
Niger	61.4%

Chart 4.7

Source- Human Development Report - 2003

## 2. Human Poverty Index (for industrial countries)

Components:

- Life expectancy below 60.
- Literacy.
- Percentage of population below the poverty index.
- Unemployment above 1 year

When determining the development level of a country it is useful to choose determinants from both categories of traditional and modern criteria.

## Human Suffering Index

This is a criterion devised as an alternative to the traditional criteria. The components of the Human Suffering Index are indicated below:

- Rate of inflation.
- Infant mortality rate.
- Rate of growth of the labour force.
- Rate of growth of the urban population.
- Per capita income.
- Per capita over consumption.
- Daily calorie supply.
- Clean drinking water facility.
- Political freedom.

## Grouping countries according to development

After measuring the development of countries by various determinants the different countries of the world have been divided into groups.

1. Developed countries
2. Developing countries

Another method in classifying the different countries according to their income.

1. High income countries - Canada, Japan
2. Middle income countries - Brazil, Mexico
3. Low income countries - Bangladesh, Nepal

### Activity 4.4



Discuss the importance of the development in human ethics considering the methods of categorising countries according to their development and the need for them.

## Challenges to Development and Sustainable Development

What is clear from development criteria and the classification of countries accordingly, is that even though economic development caused the enhancement of the quality of human lives on the whole it has not happened fairly throughout the world. The advantages and benefits of economic development have spread unevenly. Large numbers of the world's population suffer from poverty. Moreover, the natural resources such as land, water and forests are being depleted and their quality too has declined. Due to the pollution of the environment caused by the contamination of air and water and the use of poisonous chemicals by man there have occurred harmful influences on the physical health and well being of large numbers of people.

The main purpose of development is the fulfillment of human needs and expectations. Nutritional food, housing, clothes, wealth and education are basic human needs. The majority of the people in developing countries do not get these facilities at a satisfactory level. In addition to the basic needs everybody naturally expects a decent level of living.

Economic growth and development affect changes in the physical environmental systems. For instance, in the development through road construction, irrigation schemes, exploration of mineral resources, there should not be harmful results on account of interaction of humans. Resources such as forests and soil that get revitalized after they are exploited by man, should be prevented from exhasution. Further, the depleting resources such as minerals and fuel should be protected. They should be used sparingly and brought under proper management. Moreover, we must be concerned about their substitutes.

The targets of economic and social development have been redefined through the concept of sustainable development. The concept of sustainable development explains the process of use of resources, the direction of investment, the orientation of technological advancement and institutional changes. Since development must bring about economic and social development changes, it is expected to use appropriate and suitable developmental policies. The objective of sustainable development is to help the people to maintain a high quality level of living devoid of damage to resources and activities that are harmful to the environment.

### **Historical evolution of the concept of sustainable development**

Due to the stiff competitiveness that occurred in countries in order to achieve developmental targets, unforeseen risks of the future commanded the attention of the world community before long. Hence, the need for dedication to eradicate poverty through processes of economic development endowed with environmental and social responsibility, was expressed constantly at international conferences. In building up a world without poverty, sustainable development should be its base. Ideas were also expressed that building a healthy environment and an atmosphere should be considered the most crucial topics in international development.

At the first conference on environment held in Stockholm in 1972 it was emphasized to the entire world that the harmful effects caused to the environment by human activities cannot be ignored any further. In 1983 a World Commission on Environment and Development was appointed by the United Nations Organization. The report of this commissions was published in 1987 under the title “Our Common Future.” Through this the basic idea about sustainable development was introduced to the world. At the international conference on Environment and

Development held in Rio de Janeiro in June 1992, strong emphasis was laid on environmental issues. As one crucial agreement arrived at in this conference, “The Agenda for the 21st Century” can be cited. In order to implement the programme approved for sustainable development it is expected that all the nations will perform the role assigned to each of them. The subsequent emergence of several other agreements affecting the environment and development based on the lines of the Rio de Janeiro Conference of 1992, further enhances the historical importance of the programme on sustainable development.

### **Requirements to be satisfied when following the sustainable development approach**

As defined in the work “Our Common Future” sustainable development can be described as

“ Performing every activity undertaken within the development effort in order to fulfil the requirements of the present with a proper plan and in such a way that they do not hinder the needs of the future generation.”

Sustainable development is also known as viable development and lasting development.

Three requirements have to be fulfilled in order to achieve sustainable development.

1. Environmental needs
2. Social needs
3. Economic needs

#### **Environmental needs**

- Ranging rapidly towards an economic pattern that does not require plenty of power.

#### **Social needs**

- Fulfilling the essential needs of the increasing population in the developing world.

- Heading towards a level of living endurable to the environment.

### **Economic needs**

- Modernizing the technology so as to meet the challenges that emerge from the increasing consumption and the depletion of resources.

In development there occurs a clash between man and natural resources. Yet the natural resources have to be made use of.

## **Conservation of the Environment**

It is the economical use of environmental at resources and preserving them as much as possible for the future generation.

Why is conservation of the environment necessary ?

- To preserve the long term existence of natural resources
- To preserve bio diversity
- To preserve the balance of the environmental system
- To preserve the persistence of development
- To preserve the capacity of the biological persistence of earth
- To protect the beauty

## **Institutional and judicial structure related to the conservation of the environment in Sri Lanka**

### **Institutes**

- ◆ Ministry of Environment
- ◆ Central Environmental Authority
- ◆ Local Government Institutions
- ◆ Board of Investment of Sri Lanka
- ◆ Sri Lanka Tourist Board
- ◆ Ceylon Electricity Board



- ◆ Gem and Jewellery Authority
- ◆ Urban Development Authority
- ◆ Department of Craft Conservation
- ◆ National Aquatic Resources Research and Development Agency

### **Judicial Structure**

- 1895 Jungle Ordinance
- 1907 Ordinance for Prevention of Harming Animals
- 1915 Housing & Urban Development Ordinance
- 1976 Craft Conservation Act
- 1979 Mahaweli Authority Act
- 1981 National Environment Act

### **Action that can be taken to minimize environmental problems**

There are two basic actions that can be taken to minimize environmental problems.

They are

1. Taking action to maintain the existing environmental balance
2. Using natural resources so as to prevent the collapse of the environmental balance

A few actions that can be taken in implementing the above measures are indicated below :

- \* Taking steps to reduce the amount of carbon dioxide released to the environment. Taking action to introduce alternative sources of energy in this regard. Paying attention to the use of alternative sources of energy that are not

harmful to the environment, such as solar power, natural gases and alternative electricity.

- \* Prevention of the destruction of forests ( deforestation) and reforestation. Forest s absorb atmospheric carbon dioxide. It prevents the rising of the quantity of carbon dioxide in the atmosphere. Through this the green house effect can be prevented.
- \* Introduction of new paddy cultivation methods Paddy cultivation and cattle farming causes the production of nitrogen oxide methane. In developing countries the collection of water in paddy fields and cow dung produce methane. Thus the introduction of new cultivation methods for paddy fields can direct cow dung to be used for the manufacture of fertilizer..
- \* Banning the production and use of the chloraofluoro carbon (CFC) gas and other gases which are harmful to ozone.
- \* Raising awareness about the effect of ultraviolet rays (we wear hats/caps and sun-glasses when there is strong sunlight). Use of equipment that prevent the falling of sun's rays on vehicles is essential.
  
- \* International agreements and acting according to them
- \* Promoting co-operation among nations
- \* Declaration of protected areas Eg : Sinharaja forest
- \* Minimizing cultivation on hill slopes and clearing jungle for cultivation purposes
- \* Use of carbonic fertilizers in place of chemical fertilizers
- \* Establishment of sanctuaries and protected areas
- \* Stopping the sale of wild life (fauna)
- \* Use of alternative energy resources for industries
- \* Release of waste systematically
- \* Recycling

## **Duties and responsibilities of the Government and the people about the environment**

Without protecting the environment there would not be sustenance for man on earth. Hence the government that is directing the development activities of the country to a wide level along with the increase in its population should essentially follow the course of action indicated below:

1. In starting large scale development projects an environmental assessment report should be obtained through the legal institutions involved, so as to preserve the environment.
2. Inquiring into the needs of the environment from time to time taking important decisions that should be taken at national and regional level accordingly and act towards protection of the environment
3. The citizens who are engaged in a constant attempt to design a comfortable life should be instilled with an awareness of the need to pursue their activities in accordance with the relevant legal framework. They should thus be encouraged to work in accordance with that framework.
4. Implementing programmes of briefing the people.

Through education people must be given an idea about the environmental resources, their value, their contribution towards the survival of the system, and the effects on man of the harmful influences on the environment. The educational institutions have a special role to play in the conservation of the environment. Learning, teaching activities that impart skills on environment should be planned for the young generation through schools and for young adults through universities and other educational institutions. The common people should be briefed through the media of exhibitions, seminars, posters, television and radio.

## **Responsibilities of the citizens**

Fresh air, water food, medicine, housing, clothing and education are man's basic needs Apart from basic human needs, there are other needs such as comfort

recreation and security. In order to fulfill all his needs he makes use of the natural environment. If man's survival depends on his environment, harming it amounts to a serious damage one causes to oneself. Throughout the production process as well as others activities man engages day by day, he constantly adds waste matter or in other words causes some damage to the environment which means he changes the natural form of the environment. All environmental problems are the result of man's disturbing the environmental balance. However, man who is an issue of the natural environment should protect and bequath an appropriate environment to the future generation . For this, man must preserve the environmental resources.

Towards this end, the citizens of a country must work with a clear understanding of matters such as, the waste matter he releases to the environment, the damage it causes to the environment, how this damage can be minimized and whether the way he extracts

resources from the environment is appropriate. Accordingly the responsibilities of a citizen towards his environment are as follows :

- ◆ Refraining from releasing waste matter into the environment.
- ◆ Economical use of environmental resources
- ◆ Contribution to an enhancement of forest resources by measures such as tree planting campaigns.
- ◆ Raising awareness in others about the environment
- ◆ Working in adherence to the laws prevailing in the country about the environment
- ◆ Providing full cooperation to the government and other institutions that are engaged in work relative to the environment.
- ◆ Following an environmental friendly life style.

### Activity 4.5



1. Give a suitable definition of “Development”.
2. Prepare a newspaper article under the topic “Environmental issues and Sustainable Development”.

### Assignment

Most of our environmental issues can be resolved by Solid Waste Management. Introduce Solid Waste Management and explain the environmental problems which can be solved through it.

## Summary

- Environmental problems are caused due to natural factors and human activities.
- World population has, since a few decades initiated some activities in order to minimize the environmental hazards while protecting the ecological balance for the future generation.
- There have been definitions for development, and it is a constantly changing concept.
- In the modern developmental programme, improving the qualitative standard of life is meant by development.
- The concept of sustainable development is of great value since it provides future guidance as to what should be left for the future generation.
- It is clear by emphasising the responsibilities of the state and the citizens, that a number of important measures could be taken to minimize environmental hazards.