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# UNIT 1 SUSTAINABLE DEVELOPMENT AND SUSTAINABILITY

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## 1.0 OBJECTIVES

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After reading this unit, you will be able to:

- comprehend the meaning of Sustainable Development;
- define the terms 'bio capacity' and 'ecological footprint';
- realize the implications of growing population on vital human needs; and
- discover the issues pertaining to sustainable development and sustainability.

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## 1.1 INTRODUCTION

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The relation between population growth, persistence of mass poverty and progressive deterioration of our environment is indeed very complex. The old Malthusian view that overpopulation is the sole or the basic cause of poverty needs to be qualified in several ways. Technological progress has made an impressive contribution to expanding the production frontier even in agriculture

where the law of diminishing returns was expected to find its most rigorous application. Population growth is not the only or the most important factor giving rise to the world wide concern about degradation of our environment and the threat to the essential life support systems of our planet. It is now recognised that the production and consumption patterns associated with the processes of modernisation, and, in particular, the progressive increase in the use of commercial energy have contributed much more to the environmental degradation than population growth itself. Furthermore, although technical progress has very often promoted the use of new production and consumption patterns, it has also a great potential to arrest the degradation of our environment.

Sustainable development is now a central concern of international relations as well as of national policy. All through human history, the environment has been treated as a 'free good', and there was much logic in this until the early years of twentieth century. Resources were exploited by the world's people on a modest enough scale for them to be replenishable. However, in the past six to seven decades the rate of consumption has exceeded the rate of replenishment; the gap is widening and our environment capital is dwindling rapidly. The poor are the worst affected.

Degradation of natural resources and the environment on a global scale is primarily the result of unplanned development; the distorted production and consumption patterns of the industrialized countries and the consequent pressure on the natural resources led to the encroachment of the ecosystems. The economic development has been fast during the few decades but in real sense it is not a sustainable development. It is so because at the current pace of development, it is uncertain that our children and grand children will enjoy the fruits of development.

In this unit we shall be studying about the concept of sustainable development and sustainability

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## 1.2 SUSTAINABLE DEVELOPMENT

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No development in economic sense is viable without taking care of the natural resources. Such type of development is usually short term and ends abruptly with detrimental consequences. Sustainable development is an ongoing process which ensures quality life and equality of opportunities for everyone. The most accepted definition of Sustainable Development is "*the development that meets the needs of the present generation without compromising the ability of the future generations to meet their own needs.*" This definition came from the Brundtland as described in Unit 1 Block 1

It connotes with the sustainability which means maintaining, supporting or enduring. The word sustainability is derived from the Latin word *sustinere* (*tenere*, to hold; *sus*, up). Since the 1980s the term is widely used and more commonly it pertains to human sustainability on planet Earth. In view of this the result is that sustainability becomes an integral part of sustainable development.

The linkages between the population growth and development of any nation are generally thought to be inversely related. It is assumed that to achieve the

higher rates of economic development the numerical rise in the population must be curtailed. However, factors such as education, women and child health, poverty, hunger, etc. which directly or indirectly affect the population are mostly ignored in the studies of this kind. Hence, it is pertinent that when we aim for sustainable development we must not ignore the health and well being of the individuals.

### **1.2.1 Concept and Meaning of Sustainable Development and Sustainability**

Every community seeks development for its growth and better living. This development does not come free of cost. It consumes the natural resources and therefore makes way towards their reckless exploitation. Unless and until these resources are judiciously obtained and carefully used, we cannot guarantee their availability for the coming generations. Therefore, the term sustainable development becomes much relevant in today's context when the resources of the Earth are in peril. Unplanned and haphazard development planning of the past and which continues even today has created many problems and has put up a question mark on the healthy survival of human beings.

Sustainable development ensures progress in such a way that along with meeting the needs and comforts of the present generation, the equal guaranteeing of the services for the future generation is also made. The objective of sustainable development is to safeguard inter and intra generational equity to all the members of the society. There are three pillars of sustainable development viz. social, ecological and economical. The cause of misery and unequal sharing of resources is due to the fact that economical aspect is given more importance and the ecological and social well being are paid less attention. Sustainable development strikes a balance between the three pillars so that equality persists in the society.

The dictionary meaning of the term sustainability means to continue an activity without taking care of the associated risks. Sustainability can be defined as a process which ensures social, environmental and economic well being to the individuals within limited resource support. The term sustainability carries different meaning in different scenarios. It is so because several communities still today are devoid of the fruits of development and are living without access to the basic human needs. There are millions of people who do not have access to clean water or adequate food or shelter. The world's resources obviously do not grow with the growth of individuals. Therefore, poor people face a number of hardships like lack of sanitation facilities, hunger and poverty. The wealth is in the hands of very few people and therefore the social and economic inequities are growing every day. To achieve sustainability in society simply means to look after the social, economic and environmental well being of the individuals.

The concept of sustainable development focused attention on finding strategies to promote economic and social development without causing environment degradation, over-exploitation or pollution. The emphasis on development was particularly welcomed by the developing countries and the groups who were primarily concerned about poverty and social deprivation.

## 1.2.2 Environmentalism and Environmental Responsibility

Environmentalism represents a natural corollary of the doctrine of sustainable development. It seeks to redefine the relationship between human beings and nature, and between human beings themselves. It insists that human being should no longer operate as the 'masters' of the natural world but as partners with other living organisms. The perspective also calls for a thorough-going change in the organisation of human world itself.

Each organism on this planet enjoys the right to exist but with rights also come the responsibilities. Every individual living on Earth has a responsibility towards the society. Every time when we come across the imbalances caused in the environment the debates start heating up as who is the culprit and the blame game continues. With the current knowledge, the citizens in the industrialized countries recognize their role and are well informed about their contributions

It is very well understood that as individuals we are responsible for our actions which need to be checked. Further, it is also believed that an individual can play a very crucial role in environment protection and conservation of natural resources. This comes in the name of environmental responsibility. To elaborate the concept of environmental responsibility, let us take the following example:

Imagine a student named Seema lives in a place where the public transport system is well developed and her friend Geeta who lives in a distant locality where the public transport system is not so developed. The main difference between the two friends is the mode of transport they take from their home to the college. We encourage the use of public distribution system so as to reduce the carbon emissions. Seema easily uses the public transport system as it is convenient to her and it takes 1 hour to reach her destination. While for Geeta there are two options available:

- 1) Driving for one hour and reaching the college
- 2) Walking 10 minutes to the bus stop, waiting for the bus which is usually late and then travelling for 2 hours in bus to reach the college.

These are the examples that we face in our day to day life. The point to be noted here is that several factors like governance and institutional factors govern the environmental responsibility. In the example cited above it is the infrastructural deficit that is not allowing a person to shoulder the environmental responsibility.

## 1.2.3 Exploitation of Natural Resources

As it is discussed before that the earth is home to various natural resources which make life possible on this beautiful planet. Not only the human beings but also the animals and plants utilize these natural resources and carry out their day to day activities. Unfortunately these natural resources are not infinite. Earth has limited reserves of these resources and therefore care has to be taken for their optimum use.

Today the natural resources are exploited at an alarming rate. The forests are cleared, the rivers are polluted, the ground water has declined and loss of biodiversity is taking place. Along with this, development works in the name of mining and industries continue rampantly with little consideration for future. All these factors are responsible for the decline in the natural reserves and

lead to ecological degradation.. We must not consider population in just terms of number but also the quality of the life of the individuals is important. People are the ultimate resources and efforts must be made for ensuring good quality education, health and nutrition to them.

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### 1.3 ECOLOGICAL FOOTPRINT AND BIO-CAPACITY

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The ecological footprint (EF) measures how much land or water would a population require producing the renewable resources sustainably in accordance to its consumption. Bio capacity (BC) is the measure of the land whether arable, pasture or forest land and water availability within certain defined area. Ecological Footprints and Bio capacity are similar to the concepts of demand and supply in Economics. If the ecological footprint of a human population exceeds the biocapacity of its environment, the situation is unsustainable. Alarmingly, worldwide the total human ecological footprint is 2.6 global hectares per capita (gha/cap) compared with a total worldwide bio-capacity of only 1.8 gha/cap (GFN Ecological Footprint Atlas 2009). This clearly indicates that human beings are already utilizing as much as 1.4 times as many resources which are sustainably available. This situation can't last longer and will soon bring detrimental consequences if not checked at present. It is rightly said today that we are 'living on the capital of the planet rather than its income'.

#### Check Your Progress 1

**Note:** a) Use the space below for your answer.

b) Compare your answers with those given at the end of the unit.

1) Explain the meaning of sustainable development and sustainability?

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2) How does ecological footprint and bio capacity relate to each other? Explain.

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### 1.4 IMPLICATIONS OF POPULATION NEEDS ON VITAL HUMAN RESOURCES

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There is wide agreement that the earth eco-system cannot sustain current levels of economic activity and material consumption. The current rate of resource harvesting and waste generation deplete nature faster than it can regenerate. The accelerating human resources consumption that has supported the rapid economic growth and rising material standard of industrial countries in recent decades has at the same time degraded the forest, soil, water, air and biological diversity of the planet.

The threats to the sustainable use of resources come as much from inequalities in people's access to resources and from the ways in which they use them as from the sheer numbers of people. Thus concern over the 'population problem' also calls forth concern for human progress and human equality. Nor are population growth rates the challenge solely of those nations with high rates of increase. An additional person in an industrial country consumes far more and places far greater pressure on natural resources than an additional person in the Third World. Consumption patterns and preferences are as important as numbers of consumers in the conservation of resources. (*Our Common Future: Report of the World Commission on Environment and Development*)

Environmental sustainability is essential to achieving the Sustainable Development Goals, especially poverty reduction. The most fragile environmental conditions are usually found in poor countries, which typically have limited financial means and least adequate political and managerial resources to address the challenges. This threatens sustainable development and produces further deterioration in living standards and quality of life. Environmental crises, including those brought on by changing weather patterns, have the greatest impact on the poor in developing countries. As we have studied before achieving the goals of the Programme of Action of the International Conference on Population and Development (ICPD), especially universal access to gender-sensitive and quality reproductive health services will help to achieve a more favourable equation between population and available resources.

The majority of the rural poor have increasingly become clustered on low-potential land. This has resulted from a combination of factors that vary in importance from one country to another – land expropriation, intergenerational land fragmentation, privatization of common lands, consolidation and expansion of commercial agriculture with reduced need for labour. These factors continue to play an underlying role in the geographical, economic and social marginalization of the poor in most countries where there is a high incidence of poverty. The rural poor have been pushed or squeezed out of high-potential land they therefore have no choice but to overexploit the marginal resources available to them through low-input, low-productivity agricultural practices, such as overgrazing, soil-mining and deforestation, with consequent land degradation. (*Environmental Sustainability: Population, Poverty and the Environment; UNFPA*). You will be learning more about this in the next unit.

#### **1.4.1 Implications on Food and Water Supply**

Food and water security are becoming increasingly critical issues in many developing countries, especially where poverty and environmental degradation are endemic. People remain undernourished due to poverty, political instability, economic inefficiency and social inequity. Population growth is creating a demand for stepped-up food sufficiency. While world food production is projected to meet consumption demands for the next two decades, long-term forecasts indicate persistent and possibly worsening food insecurity in many countries, especially in sub-Saharan Africa. (*Environmental Sustainability: Population, Poverty and the Environment; UNFPA*)

Water is a crucial for all life on earth yet both the quantity and quality of available water supplies are declining in many parts of the world. Providing access to safe drinking water is a challenge for the socio-economic development

of any country. The escalating water crisis constitutes a major threat for global progress towards sustainable development in the new millennium.

The global water consumption rate doubles every twenty years, which is double the rate of current world population growth. According to the 2009 report of World Water Development, nearly half of the global population will be living in regions of high water stress by 2030. This water scarcity is directly related with poverty. Water-stressed countries are regions with fewer than 1,700 m<sup>3</sup> of water per person per year. It is essential that the people living in water-stressed regions must be educated to make informed decisions about using water for personal consumption, agriculture, or industry.

Regions with fewer than 1,000 m<sup>3</sup> per person per year are defined as water-scarce. Water-scarcity hinders economic development, degrades the environment, and drastically limits food availability. Nations around the world have been over pumping their aquifers. When the aquifer depletes, this causes a decline in grain production. Thus, the world's current water scarcity may lead to a devastating food scarcity. Fresh water and food production are intricately connected. Producing one ton of grain requires 1,000 tons of water which means that the water scarcity in turn leads to food shortages and increased food prices.

Clean water supplies are imperative for public health too. In scenarios where there is inadequate access to this resource may mean the prevalence of various types of water borne diseases. It is estimated that the lack of fresh adequate water affects the health of 1.2 billion people worldwide and contributes to the death of approximately 15 million children annually.

The available water sources throughout the world are becoming scarce. Groundwater reserves are over exploited due to economic growth, and farmers are given cheap subsidies for irrigation. This makes water cheap, exacerbating the problem. This has brought into focus the urgent need for planned action to manage water resources effectively for sustainable development. Similarly, the problem of water scarcity in urban areas is of particular concern. With increasing global pressures of urbanisation, industrialisation, climate change etc. coupled with existing unsustainability factors and risks inherent to conventional urban water management, cities of the future in developing countries will experience difficulties in efficiently managing scarcer and less reliable water resources.

#### **1.4.2 Implications on Housing and Sanitation Facilities**

Shelter is a fundamental human right. Proper housing is must as it increases the productivity of individuals and ensures safety and protection. A person living in footpaths is a common sight in the poor countries which is really pity.

In India, there are large numbers of people are houseless. Besides, a great portion of population lives in non-liveable houses. A major portion cannot even afford a formal house. The problem of inadequate housing is also seen in the rural areas where Below Poverty Line population lives. Housing has been primarily self-help activity for the majority of the households. In a developing country like India, problems of urban housing have been more evident. It is so because there is decreased land availability and increased construction cost. Therefore there is deteriorated quality of life in congested urban pockets.



The slums in the pockets of urban areas depict the story of poor labourers and workers who have migrated from the rural areas in search of job and livelihood opportunities. The insanitary conditions in the slums are the breeding ground of mosquitoes and viruses for various diseases. Some 2.6 billion people, half of the developing world, live without adequate sanitation facilities. The severity of the problem in India could be judged from the fact that hardly 33 per cent population has sanitation facility available. In rural area percentage coverage is only 22 percent; however it is 59 per cent in urban areas. (WHO/ UNICEF Sanitation Assessment Report 2004).

Sanitation is fundamental to human development and security. According to UNICEF Report on Water and Sanitation 2012, the combined effects of inadequate sanitation, unsafe water supply and poor personal hygiene are responsible for 88 percent of childhood deaths from diarrhoea and estimated to cause over 3,000 child deaths per day.

Interesting part to note is that providing adequate sanitation facilities is not a technical challenge. Engineers across the world know how to construct cheap hygienic toilets and sewer networks. The actual problem lies with the implementation task. It is the behaviour and habits of the individuals which needs to be checked. Along with this, the people's representatives - governments and elected political leaders - rarely give sanitation or hygiene improvements the priority that is needed in order to tackle the massive sanitation deficit faced by the developing world.

However, Swacch Bharat Abhiyan, an initiative by the Government of India has been a welcome step in this direction. It believes that the provision of improved water and sanitation facilities does not guarantee their effective use until and unless the fundamental behavioural changes are brought out. These have to become a part of daily activity in the form of clean habits and must be inculcated since childhood. Therefore, school health and hygiene education programs are an important part of water and sanitation improvements. Majority of the people defecate in open. This practice defiles ecology, fouls water resources and causes stink in inhabited areas. With the expansion of cities the space for open defecation has reduced but still poor people can be seen easing themselves along roads, railway tracks, etc which is an embarrassing sight.

These issues like the lack of access to water and sanitation, and increasing water-related disasters are directly affecting the sustainability of human settlements in different regions: These problems have incommensurable consequences on human health and well-being, safety, the environment, economic growth and development.

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## **1.5 POPULATION AND ISSUES PERTAINING TO ENVIRONMENT AND DEVELOPMENT**

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At any level of development, human impact on the environment is a function of per capita consumption and the environmental damage caused by the technology used to produce what is consumed. People in developed countries have the greatest impact on the global environment. The 20 per cent of the world's people living in the highest income countries are responsible for 86 per cent of total private consumption compared with the poorest 20 per cent,



who account for a mere 1.3 per cent. The richest fifth account for 53 per cent of carbon dioxide emissions, the poorest fifth, 3 per cent. A child born in the industrial world adds more to consumption and pollution levels in one lifetime than do 30-50 children born in developing countries. As living standards rise in developing countries, the environmental consequences of population growth will be amplified with ever-increasing numbers of people aspiring, justifiably, to “live better.” Rather than assign blame in the debate over environmental challenges, both current and new consumers need to realize and address the consequences of their levels of consumption. (Population and Sustainable Development; Population Issues- 1999 (UNFPA))

### 1.5.1 Population and Climate Change

The increase in the green house gases is mainly attributed to the industrial activities of the developed countries. It is aggravated by the unsustainable production and consumption of materials by these countries. The demographic growth in these areas is more or less stagnated or even negative for some, reducing per capita consumption is more essential than reducing the fertility rate.

It is quite evident to you now that the demographic change is closely associated with greenhouse gas emissions, and that population dynamics will play a key role in attempts to mitigate and adapt to the effects of changes in the climate system in the future. Analyzing the compositional change of populations, specifically the age composition, the distribution of people in urban and rural areas, and household size and composition, is very important for understanding future needs and potential for mitigating carbon emissions and climate change. Population dynamics cannot be overlooked in climate change adaptation strategies, and effective measures must meet the needs of the world’s most vulnerable citizens, including the needs of women.

Population, environmental degradation and poverty are linked in terms of fuel-wood, food, water and other basic needs, making impoverished people most vulnerable to the consequences of climate change. The poor countries suffer the most in this regard. A number of ecological threats and environmental catastrophes are likely to be occurring in the developing countries.

### 1.5.2 Population and Consumerism

You must have many times debated or discussed on the issue of population growth what is to be blamed: the number of people or the amount of resources consumed by these people. Along with the rise in population the consumption patterns across the world have changed which are today becoming dangerous for the human health and survival. To ensure this it is required to make concerted efforts in the key areas of economic development, education, and health.

The most developed and the emerging economies must stabilise and then reduce material consumption levels through making improvements in resource use efficiency, reducing and recycling waste, use of sustainable resources, etc. The fact remains that population and the environments are not separate issues. Demographic changes and their influences on environment should be always taken into consideration. In order to streamline the consumption issues it is

recommended to reduce the potential for urbanisation to reduce material consumption and undertaking more research into the interactions between consumption, demographic change and environmental impact.

Population and consumption taken together determine the level of human demand for resources, but the way in which demand is satisfied and the technology used is also crucial. The sustainable technologies can help to satisfy the demands through sustainable technologies, such as solar power, or through unsustainable ones like burning fossil fuels.

It is not the number of people that makes a difference to the environment but actually it is the total load of the resources that are consumed and the amount of waste produced.

At present the world population is rising at the rate of 1.2 percent per year. With growing economy, the consumption factor cannot be ignored and is also significant one. In the developed countries the number of households is increasing much rapidly than the population. Therefore the impact of population on environment in developed countries is much more as compared to the developing countries. Therefore population must be counted as households rather than as individuals. Moreover, it is also understood that disaggregating population by age, sex, education and labour-force participation provides a far better picture of population than if we perceive population as undifferentiated individuals. You must understand that the people are not just consumers but are also producers of goods and materials.

### **1.5.3 Population, Poverty and Unemployment**

Illiteracy, unemployment and poverty is the most dangerous combination for any society. Unemployment and poverty are the two major challenges that are facing the world economy at present. Owing to poor economic conditions, the poor people are unable to complete their basic education and drop out of school to work and support their families. It is common knowledge that even in the United States a high percentage of the children of poor minorities never complete their education because of poor family background. Unemployment leads to financial crisis and reduces the overall purchasing capacity of a nation. This in turn results in poverty followed by increasing burden of debt.

As per the World Bank definition, poverty implies a financial condition where people are unable to maintain the minimum standard of living. Poverty can be of absolute or relative poverty. Similarly we use the terms like urban poverty, rural poverty, primary poverty, secondary poverty and many more. The basic reason of any kind of poverty is the lack of adequate income. As per the findings of Tendulkar Committee on Poverty, India's poverty rate is estimated at 37.2 % of the total population. It must be noted that it is not necessary that the countries which are overpopulated are poor. Take Congo, for instance, which is one of the poorest countries in the world, but has a fairly light population density.

We may find that unemployment also becomes the reason of poverty. Lack of employment opportunities and the consequential income disparity bring about mass poverty in most of the developing and under developed economies of the world.

In India, the problems of unemployment and poverty have always been major obstacles to economic development. Underemployment and unemployment have crippled the Indian economy from time to time. Even during the period of good harvest, the Indian farmers are not employed for the entire year. Regional disparity is also crucial in this context. A part of the urban workforce in India is subjected to sub-employment. Mass migration from rural to urban regions is adding to the problems of unemployment and poverty in India.

Economic reforms, changes in the industrial policy and better utilization of available resources are expected to reduce the problem of unemployment and poverty that results from it. The economic reform measures need to have major impacts on the employment generating potential of the economy. The governmental bodies are also required to initiate long term measures for poverty alleviation. Generation of employment opportunities and equality in income distribution are the two key factors that are of utmost importance to deal with the dual problem of unemployment and poverty.

### Check Your Progress 2

**Note:** a) Use the space below for your answer.

b) Compare your answers with those given at the end of the unit.

- 1) What are the consequences of lopsided development on food and water supply in a given region?

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- 2) Establish a relation between poverty, unemployment and population growth of any nation.

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## 1.6 LET US SUM UP

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The terms sustainability and sustainable development have been described. The unit explains the implications of population growth on human needs like water, food, shelter, etc.. A large area of the world suffers from land degradation, deforestation, and water shortages. Climate change aggravates the situation and increases the intensity and frequency of natural disasters. All these changes ultimately culminate in the problems such as poverty and unemployment. Therefore the main idea behind the unit is that you must look beyond the population figures and must consider the qualitative and human based approach towards population dynamics. This goes in favour of the notion of sustainable development.

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## 1.7 KEY WORDS

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- Sustainability** : A process which ensures social, environmental and economic well being to the individuals within limited resource support.
- Environmental Responsibility** : The responsibility of an individual towards environment and its well being
- Poverty** : It is a state where one lacks a certain amount of material possessions or money.
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## 1.8 REFERENCES AND SUGGESTED READINGS

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## 1.9 ANSWERS TO CHECK YOUR PROGRESS

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### Check Your Progress 1

- 1) Your answer must include the following points:
  - Development Vs. Sustainable Development
  - Need of sustainability and sustainable development
- 2) Your answer must include the following points:
  - Relation between biocapacity and ecological footprint
  - Any example relevant in the current scenario

### Check Your Progress 2

- 1) Your answer must include the following points:
  - Excessive land utilization for food production
  - Limited fresh water supplies
  - Basic needs of human beings
  - Increasing population growth
- 2) Your answer must include the following points:
  - Limited resources on Earth
  - Lopsided development and uneven distribution of resources has led to exploitation of natural resources
  - Mechanisation resulting in unemployment