Chapter 7: Environment and Sustainable Development

Exercises — Environment and Sustainable Development

Q1 What is meant by environment?

SOLUTION

Environment is defined as the total planetary inheritance and the totality of all resources. It includes all the biotic and abiotic factors that influence each other.

Biotic elements are all living elements such as birds, animals, plants, forests and fisheries. Abiotic elements include non-living elements such as air, water and land. Rocks and sunlight are examples of abiotic elements.

A study of the environment involves examining the inter-relationship between these biotic and abiotic components.

Answer: Environment is the total planetary inheritance and totality of all resources, encompassing all biotic (living) and abiotic (non-living) factors that influence each other.

Q2 What happens when the rate of resource extraction exceeds that of their regeneration?

SOLUTION

When the rate of resource extraction exceeds the rate of regeneration of resources, the environment fails to perform its vital functions. Specifically, it can no longer sustain life by providing genetic and biodiversity, and its capacity to assimilate waste is overwhelmed.

This situation leads to an environmental crisis. Many resources become extinct and the wastes generated go beyond the absorptive capacity of the environment. Absorptive capacity refers to the ability of the environment to absorb degradation.

The result is that we are pushed to the threshold of an environmental crisis. Past development has polluted and dried up rivers and other aquifers, making water an economic good. The intensive and extensive extraction of both renewable and non-renewable resources has exhausted some of these vital resources, compelling society to spend huge amounts on technology and research to explore new ones.

Added to this are the health costs of degraded environmental quality — decline in air and water quality has resulted in increased incidence of respiratory and water-borne diseases, raising expenditure on health.

Answer: When resource extraction exceeds regeneration, the environment fails to sustain life and assimilate waste, leading to resource depletion, pollution, environmental crisis, and rising health and economic costs.

Q3 Classify the following into renewable and non-renewable resources: (i) trees (ii) fish (iii) petroleum (iv) coal (v) iron-ore (vi) water.

SOLUTION

Renewable resources are those which can be used without the possibility of the resource becoming depleted or exhausted, meaning a continuous supply of the resource remains available.

Non-renewable resources are those which get exhausted with extraction and use.

Renewable resources: (i) trees, (ii) fish, (vi) water — these can regenerate naturally if used within sustainable limits.

Non-renewable resources: (iii) petroleum, (iv) coal, (v) iron-ore — these get exhausted with extraction and use and cannot be regenerated.

Answer: Renewable: trees, fish, water. Non-renewable: petroleum, coal, iron-ore.

Q4 Two major environmental issues facing the world today are _____ and _____.

SOLUTION

The chapter specifically discusses two major global environmental issues: global warming and ozone depletion.

Global warming is a gradual increase in the average temperature of the earth's lower atmosphere as a result of the increase in greenhouse gases — primarily carbon dioxide and methane — since the Industrial Revolution, caused by the burning of fossil fuels and deforestation.

Ozone depletion refers to reductions in the amount of ozone in the stratosphere, caused by high levels of chlorine and bromine compounds (from CFCs and halons), which allow more ultraviolet radiation to reach the earth and harm living organisms.

Answer: Two major environmental issues facing the world today are global warming and ozone depletion.

Q5 How do the following factors contribute to the environmental crisis in India? What problem do they pose for the government? (i) Rising population (ii) Air pollution (iii) Water contamination (iv) Affluent consumption standards (v) Illiteracy (vi) Industrialisation (vii) Urbanisation (viii) Reduction of forest coverage (ix) Poaching, and (x) Global warming.

SOLUTION

(i) Rising population: India supports approximately 17 per cent of the world's human and 20 per cent of livestock population on a mere 2.5 per cent of the world's geographical area. This high population density places enormous pressure on finite natural resources — land, water and forests — causing land degradation, resource depletion and increased waste generation. For the government it means constantly rising demand for food, water, housing and energy, making environmental management extremely difficult.

(ii) Air pollution: In urban areas, vehicles are the major contributors to air pollution. The number of motor vehicles increased from about 3 lakh in 1951 to 35 crores in 2022, with two-wheelers and cars constituting about 85 per cent of registered vehicles. Industrial clusters and thermal power plants also contribute significantly. Since vehicular emissions are ground-level sources, they have maximum impact on the general population. The government faces huge expenditure on healthcare and on monitoring and controlling pollution through bodies like the CPCB.
(iii) Water contamination: Seventy per cent of water in India is polluted, as stated in the chapter. Contamination of rivers, aquifers and other water bodies through industrial effluents, agricultural run-off and untreated sewage has led to increased incidence of water-borne diseases. For the government, this raises healthcare costs and requires large investments in water treatment infrastructure.
(iv) Affluent consumption standards: High consumption and production standards — particularly in developed countries and among the affluent sections — place a huge stress on the environment in terms of resource extraction and waste generation. Rising incomes increase demand for goods and services whose production depletes resources and generates pollution. The government has to manage growing waste, regulate industrial output and deal with the consequences of over-consumption.
(v) Illiteracy: Though the chapter mentions illiteracy as a contributing factor, it does not elaborate on it in detail. In general, lack of awareness due to illiteracy can lead to improper use of resources, non-adoption of sustainable practices, and disregard for environmental regulations — making it harder for the government to implement conservation programmes effectively.
(vi) Industrialisation: India is one of the ten most industrialised nations of the world. Industrialisation has brought unplanned urbanisation, pollution, and the risk of accidents. The CPCB has identified seventeen categories of large and medium scale industries as significantly polluting. Increased industrial activity leads to water, air and land pollution. The government must invest in pollution control boards, regulation, and clean-up of industrial damage.
(vii) Urbanisation: Rapid and unplanned urbanisation — a consequence of industrialisation — concentrates population and economic activity in cities, increasing pressure on urban infrastructure, land, water and air. It generates large volumes of solid and liquid waste. The government faces the challenge of managing urban growth while maintaining environmental quality.
(viii) Reduction of forest coverage: The per capita forest land in India is only 0.06 hectare against the requirement of 0.47 hectare to meet basic needs, resulting in excess felling of about 15 million cubic metres of forests over the permissible limit annually. Deforestation leads to land degradation, biodiversity loss, soil erosion, and air pollution. Loss of vegetation increases soil erosion — India loses soil at 5.3 billion tonnes a year — and depletes nutrients. The government must fund reforestation, regulate logging, and manage the competing land use pressures from agriculture, human settlements and industry.
(ix) Poaching: Poaching involves illegal hunting and killing of wildlife. It directly contributes to biodiversity loss, which is listed as one of the priority environmental concerns in India. It disrupts ecological balance as species that control pest populations (like snakes and birds of

prey) are killed. The government faces the challenge of enforcing wildlife protection laws and protecting endangered species.

(x) Global warming: Global warming is caused by the rise in greenhouse gases (carbon dioxide, methane etc.) from burning of fossil fuels and deforestation. Its consequences include melting of polar ice, rise in sea levels, coastal flooding, disruption of water supplies, extinction of species, more frequent tropical storms, and increased incidence of tropical diseases. For the government, global warming entails large additional financial commitments for adaptation, disaster management, healthcare, and participation in international agreements such as those agreed at Kyoto.

Answer: Each factor — from population pressure and pollution to deforestation and global warming — degrades natural resources and raises environmental costs, forcing the government to spend heavily on healthcare, pollution control, conservation and international climate commitments.

Q6 What are the functions of the environment?

SOLUTION

The environment performs four vital functions:

First, it supplies resources — both renewable and non-renewable. Renewable resources such as trees and fish can be used without the possibility of the resource becoming exhausted, as a continuous supply remains available. Non-renewable resources such as fossil fuels get exhausted with extraction and use.

Second, it assimilates waste. The environment has the capacity to absorb and break down the wastes generated by human activities, known as its absorptive capacity.

Third, it sustains life by providing genetic and bio diversity. This is the vital life-support function of the environment.

Fourth, it provides aesthetic services such as scenery and natural beauty.

The environment can perform these functions without interruption as long as the demand on these functions is within its carrying capacity — meaning the rate of resource extraction does not exceed the rate of regeneration, and wastes generated remain within the assimilating capacity of the environment.

Answer: The environment performs four functions: (i) supplies renewable and non-renewable resources, (ii) assimilates waste, (iii) sustains life through genetic and bio diversity, and (iv) provides aesthetic services like scenery.

Q7 Identify six factors contributing to land degradation in India.

SOLUTION

The chapter lists several factors responsible for land degradation in India. Six of them are:

1. Loss of vegetation occurring due to deforestation.
2. Unsustainable fuel wood and fodder extraction.

3. Shifting cultivation and encroachment into forest lands.
4. Indiscriminate use of agro-chemicals such as fertilisers and pesticides.
5. Improper planning and management of irrigation systems.
6. Extraction of ground water in excess of the recharge capacity.

Other factors mentioned include improper crop rotation, forest fires and over-grazing, non-adoption of adequate soil conservation measures, open access resources, and poverty of agriculture-dependent people.

Answer: Six factors: (i) deforestation, (ii) unsustainable fuel wood and fodder extraction, (iii) shifting cultivation, (iv) indiscriminate use of agro-chemicals, (v) improper irrigation management, and (vi) over-extraction of ground water.

Q8 Explain how the opportunity costs of negative environmental impact are high.

SOLUTION

The opportunity cost of negative environmental impact refers to the benefits foregone and the additional expenditure required as a result of environmental damage.

When environmental quality declines — through pollution of air and water, depletion of resources and degradation of land — society is forced to spend large sums to cope with the consequences. For instance, seventy per cent of water in India is polluted, which has resulted in increased incidence of respiratory and water-borne diseases; hence expenditure on healthcare rises significantly.

The intensive and extensive extraction of renewable and non-renewable resources has exhausted some vital resources, compelling society to spend huge amounts on technology and research to explore new resources. These are resources and funds that could have been used elsewhere — for education, infrastructure or economic development.

Global environmental issues such as global warming and ozone depletion also contribute to increased financial commitments for the government — for adaptation, disaster management and meeting international obligations.

Thus, the opportunity costs are high because environmental degradation diverts financial resources away from productive uses, raises healthcare and remediation costs, and makes essential resources like water more expensive economic goods.

Answer: Negative environmental impacts force society to spend heavily on healthcare, finding new resources, and managing disasters — resources that could have been used productively elsewhere, making the opportunity costs of environmental damage very high.

Q9 Outline the steps involved in attaining sustainable development in India.

SOLUTION

According to the chapter, the following steps and strategies are important for attaining sustainable development in India:

1. Use of non-conventional sources of energy: Shifting from thermal and hydro power (which

have adverse environmental impacts) to wind power and solar energy, which have far lower environmental costs.

2. LPG and gobar gas in rural areas: Replacing wood and dung cake (which cause deforestation and air pollution) with subsidised LPG and gobar gas plants. Gobar gas plants use cattle dung as input, produce clean fuel, and the leftover slurry serves as organic fertiliser.

3. CNG in urban areas: Use of Compressed Natural Gas (CNG) as fuel in public transport, as has been done in Delhi and other Indian cities, significantly lowering air pollution.

4. Wind power: Setting up wind mills in areas of high wind speed to generate electricity without adverse environmental impact.

5. Solar power through photovoltaic cells: Converting solar energy into electricity using photovoltaic cells, which is particularly useful for remote areas and is entirely pollution-free. India is leading the International Solar Alliance (ISA).

6. Mini-hydel plants: Using perennial streams in mountainous regions to run small turbines and generate electricity locally, avoiding large-scale transmission infrastructure.

7. Traditional knowledge and practices: Reviving traditional, environment-friendly practices in agriculture, healthcare (Ayurveda, Unani, folk systems), housing and transport that are inherently sustainable.

8. Biocomposting: Replacing chemical fertilisers with organic compost — including vermicomposting using earthworms — to reduce chemical contamination and improve soil quality.

9. Biopest control: Using plant-based pesticides (such as those derived from neem), mixed cropping, crop rotation, and encouraging natural predators (snakes, owls, lizards) to control pests instead of chemical pesticides.

Answer: Steps include: using non-conventional energy (solar, wind, CNG, mini-hydel), promoting LPG and gobar gas in rural areas, reviving traditional knowledge, biocomposting, and biopest control — all aimed at reducing environmental damage while meeting development needs.

Q10 India has abundant natural resources — substantiate the statement.

SOLUTION

India is indeed richly endowed with natural resources across several dimensions.

Soil: India has rich quality soil. The black soil of the Deccan Plateau is particularly suitable for cultivation of cotton, which has led to the concentration of textile industries in the region. The Indo-Gangetic plains — spread from the Arabian Sea to the Bay of Bengal — are one of the most fertile, intensively cultivated and densely populated regions in the world.

Water: India has hundreds of rivers and tributaries that provide water for agriculture and human use.

Forests: India has lush green forests, though unevenly distributed, which provide green cover for a majority of its population and natural cover for wildlife.

Minerals: Large deposits of iron-ore, coal and natural gas are found in the country. India accounts for nearly 8 per cent of the world's total iron-ore reserves. Other minerals found in different parts of the country include bauxite, copper, chromate, diamonds, gold, lead, lignite,

manganese, zinc and uranium.

Marine resources: India has a vast stretch of the Indian Ocean at its disposal.

Mountains: Ranges of mountains such as the Himalayas provide small, snow-fed perennial streams — among the few fresh-water sources that remain relatively unpolluted.

Answer: India has abundant natural resources including fertile soil (Deccan Plateau, Indo-Gangetic Plains), hundreds of rivers, forests, vast mineral deposits (8% of world's iron-ore reserves), marine resources, and mountain ranges with perennial streams.

Q11 Is environmental crisis a recent phenomenon? If so, why?

SOLUTION

Environmental crisis is largely a recent phenomenon, and the chapter explains why.

In the early days of civilisation, before the phenomenal increase in population and before industrialisation, the demand for environmental resources and services was much less than their supply. Pollution was within the absorptive capacity of the environment, and the rate of resource extraction was less than the rate of regeneration of resources. Hence environmental problems did not arise.

With population explosion and the advent of the Industrial Revolution, things changed dramatically. The need to meet the growing demands of an expanding population pushed the demand for resources for both production and consumption beyond the rate of regeneration. The pressure on the absorptive capacity of the environment increased tremendously.

The result was a reversal of the supply-demand relationship for environmental quality. Earlier, supply of environmental resources exceeded demand. Now, we face increased demand for environmental resources and services while their supply is limited due to overuse and misuse. This has made the environmental issues of waste generation and pollution critical today.

The rising population of developing countries and the affluent consumption and production standards of the developed world have together placed a huge stress on the environment, making environmental crisis a product of modern economic development.

Answer: Yes, environmental crisis is largely a recent phenomenon. Before industrialisation and population explosion, resource extraction was below regeneration rates. The Industrial Revolution and rising population reversed this, creating excess demand over supply of environmental resources and pushing us toward environmental crisis.

Q12 Give two instances of (a) Overuse of environmental resources (b) Misuse of environmental resources.

SOLUTION

(a) Overuse of environmental resources:

1. Extraction of ground water in excess of its recharge capacity — the chapter lists this as one of the factors leading to land degradation in India.
2. Excess felling of forests — the per capita forest land in India is only 0.06 hectare against the

requirement of 0.47 hectare, resulting in an excess felling of about 15 million cubic metres of forests over the permissible limit.

(b) Misuse of environmental resources:

1. Indiscriminate use of agro-chemicals (chemical fertilisers and pesticides) in agriculture, which has contaminated soil, water bodies and even ground water, and led to contamination of food products, milk, meat and fish.

2. Burning of fossil fuels and deforestation leading to increased greenhouse gas concentrations — the atmospheric concentration of carbon dioxide rose by 31 per cent and methane by 149 per cent above pre-industrial levels since 1750, causing global warming.

Answer: (a) Overuse: excess ground water extraction beyond recharge capacity; excess felling of forests beyond the permissible limit. (b) Misuse: indiscriminate use of chemical fertilisers and pesticides; burning of fossil fuels releasing greenhouse gases.

Q13 State any four pressing environmental concerns of India.

SOLUTION

The chapter identifies the following priority environmental concerns of India:

1. Land degradation — India's land suffers from varying degrees and types of degradation stemming from unstable use and inappropriate management practices, with soil being eroded at a rate of 5.3 billion tonnes a year for the entire country.

2. Biodiversity loss — developmental activities have created impacts on human health and well-being and led to loss of biological diversity.

3. Air pollution, with special reference to vehicular pollution in urban cities — the number of motor vehicles increased from about 3 lakh in 1951 to 35 crores in 2022, with two-wheelers and cars constituting about 85 per cent of registered vehicles.

4. Management of fresh water — past development has polluted and dried up rivers and other aquifers, making water an economic good.

The fifth priority issue mentioned in the chapter is solid waste management.

Answer: Four pressing environmental concerns of India: (i) land degradation, (ii) biodiversity loss, (iii) air pollution especially from vehicles in urban areas, and (iv) management of fresh water.

Q14 Correction for environmental damages involves opportunity costs — explain.

SOLUTION

Opportunity cost refers to the value of the next best alternative that is foregone when a choice is made. When environmental damage occurs, correcting it requires resources — money, time, technology and labour — that could have been used for other productive purposes. This is the opportunity cost of environmental correction.

The chapter illustrates this through several examples. Seventy per cent of water in India is polluted, leading to increased incidence of water-borne diseases; hence expenditure on health rises. This money could otherwise have been spent on education, infrastructure or economic

development.

The intensive extraction of renewable and non-renewable resources has exhausted some vital resources, compelling society to spend huge amounts on technology and research to explore new ones. These resources could have been deployed for other development activities.

Global environmental issues such as global warming and ozone depletion also contribute to increased financial commitments for the government — for adaptation, disaster relief and meeting international climate obligations. The chapter explicitly states that the opportunity costs of negative environmental impacts are high.

Thus, correcting for environmental damage consumes scarce public resources that could have been allocated to education, health, infrastructure or poverty alleviation, making the opportunity cost of environmental mismanagement very significant.

Answer: Correcting environmental damage requires spending on healthcare, research for new resources, and climate adaptation — money that could have been used for education, infrastructure or development. The chapter explicitly states that opportunity costs of negative environmental impacts are high.

Q15 Explain how the supply-demand reversal of environmental resources account for the current environmental crisis.

SOLUTION

In the early stages of civilisation, the demand for environmental resources and services was much less than their supply. The rate of resource extraction was below the rate of regeneration, and pollution remained within the absorptive capacity of the environment. As a result, environmental problems did not arise.

With population explosion and the Industrial Revolution, however, a fundamental reversal took place. Rising population and rising production and consumption needs pushed the demand for resources far beyond the rate of their regeneration. At the same time, the pressure on the absorptive capacity of the environment increased tremendously because of the massive amounts of waste being generated.

This reversal of the supply-demand relationship for environmental quality means that society now faces increased demand for environmental resources and services, while their supply is limited and declining due to overuse and misuse.

Many resources have become extinct and the wastes generated are beyond the absorptive capacity of the environment. The environment can no longer perform its vital functions of sustaining life and assimilating waste. The result is the environmental crisis visible today — polluted rivers and aquifers, resource depletion, land degradation, air pollution, biodiversity loss, and global problems such as global warming and ozone depletion.

Thus, the current environmental crisis is directly explained by this reversal: what was once a situation of abundant supply relative to demand has become one of scarce supply facing surging demand.

Answer: Earlier, resource supply exceeded demand and pollution stayed within absorptive capacity. Population explosion and industrialisation reversed this — demand now exceeds regeneration rates and waste exceeds absorptive capacity — producing the current environmental crisis of resource depletion, pollution and biodiversity loss.

Q16 Highlight any two serious adverse environmental consequences of development in India. India's environmental problems pose a dichotomy — they are poverty induced and, at the same time, due to affluence in living standards — is this true?

SOLUTION

Two serious adverse environmental consequences of development in India:

1. Land degradation: Developmental activities have put immense pressure on India's finite natural resources. Soil is being eroded at a rate of 5.3 billion tonnes a year for the entire country, causing the loss of 0.8 million tonnes of nitrogen, 1.8 million tonnes of phosphorus and 26.3 million tonnes of potassium annually. According to the Government of India, nutrients lost due to erosion each year range from 5.8 to 8.4 million tonnes.

2. Air and water pollution: Seventy per cent of water in India is polluted. India's rapidly growing number of vehicles — 35 crores in 2022 — and industrial clusters have led to widespread air pollution, especially in urban areas. Decline in air and water quality has led to increased incidence of respiratory and water-borne diseases.

The dichotomy — poverty-induced vs affluence-induced degradation:

Yes, this is true. The chapter explicitly states that the threat to India's environment poses a dichotomy. On one hand, there is the threat of poverty-induced environmental degradation. Poor people, out of necessity, resort to practices such as deforestation for fuel wood, unsustainable extraction of forest produce, overgrazing and encroachment of forest lands, leading to land degradation and biodiversity loss.

On the other hand, there is the threat of pollution from affluence and a rapidly growing industrial sector. Rising incomes lead to greater consumption — more vehicles, more industrial production, more waste — all of which contribute to air pollution, water contamination, solid waste problems and increased energy use from fossil fuels.

India thus faces environmental challenges from both ends of the income spectrum simultaneously, making environmental management particularly complex.

Answer: Two consequences: land degradation (soil erosion at 5.3 billion tonnes/year) and widespread air and water pollution (70% of water polluted; 35 crore vehicles by 2022). The dichotomy is real — poverty drives deforestation and over-extraction, while affluence and rapid industrialisation drive pollution and consumption-based degradation.

Q17 What is sustainable development?

SOLUTION

Sustainable development was defined by the United Nations Conference on Environment and Development (UNCED) as: 'Development that meets the need of the present generation without compromising the ability of the future generation to meet their own needs.'

The seminal report — Our Common Future — elaborated on this as 'meeting the basic needs of all and extending to all the opportunity to satisfy their aspirations for a better life.' The term 'need' in the definition is linked to distribution of resources, making it also a moral issue about redistribution.

Edward Barbier defined sustainable development as one which is directly concerned with increasing the material standard of living of the poor at the grassroot level — measurable in terms of increased income, educational services, health care, sanitation and water supply. It aims at decreasing the absolute poverty of the poor by providing lasting and secure livelihoods that minimise resource depletion, environmental degradation, cultural disruption and social instability.

The Brundtland Commission emphasised protecting future generations — that the present generation has a moral obligation to hand over the planet in good order to the future generation, bequeathing at least as good a stock of 'quality of life' assets as what we have inherited.

According to Herman Daly, sustainable development requires: limiting human population to the carrying capacity of the environment; ensuring technological progress is input-efficient rather than input-consuming; extracting renewable resources only at the rate of regeneration; ensuring that for non-renewable resources, the rate of depletion does not exceed the rate of creation of renewable substitutes; and correcting inefficiencies arising from pollution.

Answer: Sustainable development is 'development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs.' It balances economic growth with environmental conservation and equity, aiming to meet basic needs of all while preserving the planet for the future.

Q18 Keeping in view your locality, describe any four strategies of sustainable development.

SOLUTION

The chapter describes several strategies for sustainable development. Four of these, which can be related to any Indian locality, are:

1. Use of solar power through photovoltaic cells: India is naturally endowed with abundant solar energy. With the help of photovoltaic cells, solar energy can be converted into electricity. This technology is entirely pollution-free and extremely useful for remote areas where power supply through grid or power lines is either not possible or very costly. India is also leading the International Solar Alliance (ISA).

2. Biocomposting: Farmers in large numbers across the country have reverted to using compost made from organic wastes instead of chemical fertilisers. Earthworms can convert

organic matter into compost faster than the normal composting process (vermicomposting). This reduces chemical contamination of soil and ground water, decreases the volume of waste the civic authorities must dispose of, and improves soil health.

3. Biopest control: Rather than using chemical pesticides — which contaminate food, soil and water — the use of plant-based pesticides derived from neem, mixed cropping, crop rotation, and encouraging natural predators such as snakes, owls, peacocks and lizards to control pests are sustainable alternatives available in most localities.

4. Traditional knowledge and practices: Indian people have traditionally been close to their environment. India has about 15,000 species of plants with medicinal properties, about 8,000 of which are in regular use in Ayurveda, Unani, Tibetan and folk systems. These healthcare systems are environment-friendly, relatively free from side effects, and do not involve large-scale industrial and chemical processing. Reviving such traditional practices reduces dependence on chemically intensive modern systems.

Answer: Four strategies: (i) solar power through photovoltaic cells — pollution-free electricity generation; (ii) biocomposting and vermicomposting — replacing chemical fertilisers with organic compost; (iii) biopest control using neem-based pesticides and natural predators; (iv) reviving traditional knowledge systems such as Ayurveda and organic farming practices.

Q19 Explain the relevance of intergenerational equity in the definition of sustainable development.

SOLUTION

Intergenerational equity refers to the principle of fairness between the present generation and future generations — the idea that the present generation should not enjoy development at the cost of the well-being of future generations.

The UNCED definition of sustainable development places intergenerational equity at its core: 'Development that meets the need of the present generation without compromising the ability of the future generation to meet their own needs.' The phrase 'future generations' is, as the chapter notes, one of the catch phrases of the definition.

The Brundtland Commission emphasised protecting future generations and the argument that we have a moral obligation to hand over the planet earth in good order to the future generation. The present generation should bequeath a better — or at least equally good — environment to the future generation. The chapter states: 'At least we should leave to the next generation a stock of quality of life assets no less than what we have inherited.'

The present generation can promote intergenerational equity by: (i) conservation of natural assets; (ii) preservation of the regenerative capacity of the world's natural ecological systems; and (iii) avoiding the imposition of added costs or risks on future generations.

Herman Daly's conditions for sustainable development also reflect intergenerational equity — renewable resources should be extracted only at the rate of regeneration, and for non-renewable resources, the rate of depletion should not exceed the rate of creation of renewable substitutes, so that future generations are not deprived of these resources.

Thus, intergenerational equity is not merely a philosophical ideal in the definition of sustainable

development — it is the operational rationale that constrains the pace and nature of resource use in the present.

Answer: Intergenerational equity — fairness between present and future generations — is central to sustainable development. The Brundtland definition explicitly requires that the present generation's development not compromise future generations' ability to meet their own needs, making it both a moral obligation and an operational constraint on resource use.