UNIT 10: SUSTAINABLE DEVELOPMENT - I

UNIT STRUCTURE

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10.1 LEARNING OBJECTIVES

After going through this unit, you will be able to:

- define sustainable development
- explain strong and weak sustainability
- explore the indicators of sustainable development.

10.2 INTRODUCTION

Sustainable development is an organizing principle for human wealth on a finite planet. Sustainable development ties together concern for the carrying capacity of natural system with the social and economic challenges faced by humanity. It is a larger issue encompassing a balanced approach towards economic, ecological and social development. The term sustainable development began to gain with acceptance in the late 1980s after its appearance in Our Common Future also known as the Brundtland Report. According to Brundtland Commission

(1987) sustainable development is that which meets the needs of the present without compromising the ability of future generation to meet their own needs.

The concept of sustainable development aims at maximizing the net benefits of economic activities, subject to maintaining the stock of productive assets over time and providing a social safety net to meet the basic needs of the poor. Sustainable development attempts to accelerate development in an environmentally responsible manner keeping in mind the inter-generational and intra generational equity requirements. It is a process in which development can be sustained for generations. It affords to the future generation the same, if not more, capacity to prosper as the present generation have.

The basic rule behind the sustainable development strategy is that the total amount of capital that is passed on to the next generation should not be less that the capital the current generation inherited. The three important components or aims of sustainable development include: (a) uplifting the standard of living of the mass people by adopting a reliable growth path (i.e. economic sustainability), (b) equitable and just distribution of resources so that mass people have access to the basic needs of life (i.e., social sustainability) and (c) environmental resources need to be deployed in such a fashion so that the inputs providing and waste assimilating capacity of our planet earth remain intact through generations (i.e., ecological sustainability).

This is the first unit on sustainable development. In this unit, a brief history of the concept of sustainable development has been discussed. In addition to that, the concepts of weak and strong sustainability, its indicators and measurements have been discussed.

In the next unit, we shall discuss some of the issues relating to sustainable development from the Indian perspectives. In this context, some of policy provisions like the Environment Protection Act, Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act, Wildlife Protection Act, Forest Conservation Act shall be discussed.

10.3 HISTORY OF SUSTAINABLE DEVELOPMENT

The world commission on Environment and Development' draw the world's attention to the accelerating deterioration of the human environment and natural resources and the consequences of that deterioration for economic and social development. The commission called attention for two important aspects: first, the well being of the environment, of economies

and of people is inextricably linked and second, sustainable development involves co-operation on a global scale.

The earlier concept of sustainable development emphasized the need for economic development to be compatible with constraint set by the natural environment. It is affected by the economic, ecological, social and political factors simultaneously. Sustainable development is about integration developing in a way that benefits the widest possible range of sectors, across borders and even between generations. The classical development approach generally relies on the principle of efficiency. In the neo classical approach efficiency is the guiding principle for production and consumption decision. But apart from efficiency some other important attributes such as equity, proper valuation of resources, resilience of ecology etc are incorporated in sustainable development.

Thomas Robert Malthus and Justers Von Liebig were the earlier economists related to the issue of sustainable development. Earlier in 20th century social scientists like Thorstein Veblen and A. C. Pigou draw attention to external costs of economic activities. United Nations published report on 'Man and his Environment' in 1969. This report focused on activities to avoid environmental degradation. The first use of the term sustainable in modern sense was by the Club of Rome in 1972 in its epoch-making report on the 'Limits to Growth'. The first 'UN and UNEP World Conference on Human Environment' was held in Stockholm in 1972. It had the slogan of 'only one earth' i.e. Our Common Future. The then Indian Prime Minister Indira Gandhi emphasized that the removal of poverty is an integral part of the goal of an environmental strategy for the world. In 1975 UNESCO Conference on Education about the Environment was made for setting up a global environmental education framework. International Congress of the Human Environment, Kyoto emphasized on the same issue like Stockholm (1972). There were various other programmes related to sustainable development in the later years. They can be mentioned as 'The First World Climate Conference' in Geneva (1979) for the creation of the climate change research and programme monitoring, the first 'UN Conference on Least Developed Countries', Paris (1981) for helping the underdeveloped countries, 'Establishment of United Nations World Commission on Environment and Development' (1984)for the cooperation between developed and developing countries and the adoption of global development plans on environmental conservation, 'Montreal Protocol' (1987) was for the protection of the ozone layer, 'The Second World Climate Conference', (1990) Geneva, also gave stressed on the climate change, 'United Nations Conference on Environment and Development' (1992) i.e. the Earth Summit or Rio Conference declared the Agenda 21 Action Plan, The Kyoto Protocol (1997) was signed between countries to reduce CO_2 and other

greenhouse gas emissions, with commencement in 2005. UN published Millennium Development Goals (MDGs) in the year 2000. 'The World Summit on Sustainable Development, Johannesburg (2002), reaffirmed the previous obligations and set the guidelines for implementation of the concept in the future. 'The Third World Climate Conference' (2009), Geneva, was for further development of the global Climate Change Monitoring System with the aim of timely anticipation of possible disasters. 'UN Sustainable Development Summit'(2015), published 17 Millennium Development Goals which should be achieved by 2030 relating to sustainable development.

10.5 WEAK AND STRONG SUSTAINABLITY

Broadly, the concept of sustainable development has evolved along two different approaches i.e. the outcome approach which emphasizes flow variables and opportunity approach which emphasizes stock variables. Opportunity approach can further be classified as strong and weak sustainability. Economic sustainability defined in terms of strong and weak emphasizes ecological sustainability of development encircling intra and inter generational equity.

The concept of weak sustainability is based upon the work of Nobel Laureate Robert Solow and Hartwick. Weak sustainability has been defined using concepts like human capital and natural capital. Human or produced capital incorporates resource such as infrastructure, labourand knowledge. Natural capital covers the stock of environmental assets such as fossil fuels, biodiversity and other eco system service. The notion of weak sustainability states that human capital can be substituted by natural capital. Within weak sustainability the overall stock of man- made capital and natural capital remains constant over time and so here unconditional substitution between various kinds of capital is allowed.

Example: An example of weak sustainability may be mining coal and using it for production of electricity. The natural resource coal is replaced by manufactured good electricity. The electricity then can be used to improve quality of human life. Electricity can be used to produce many manufactured material in the industries or it can be used for the household purpose.

On the other hand strong sustainability assumes that human capital and natural capital are complementary, but not interchangeable. It accepts that there are certain functions that the environment performs that cannot be duplicated by human or man-made capital. For example some functions of the environment such as eco system, maintenance of the climate, ozone layer, bio diversity etc. cannot be replaced by the man-made capital. Strong sustainability aims

for the maintenance of economic environment, and social capital through an efficient use of resources and by replacing non-renewable natural resources with renewable ones.

CHECK YOUR PROGRESS

Q 1: What is meant by sustainable development? (Answer in about 50 words)

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Q 2: State whether the following statement is true or false (T/F).

Burndtland commission was held on 1987. (T/F)

Q 3: Define weak sustainability. (Answer in about 20 words)

Q 4: What is meant by strong sustainability? (Answer in about 20 words)

10.6 INDICATORS OF SUSTAINABLE DEVELOPMENT

Indicators are used for the empirical specification of concepts that cannot be fully operationalised on the basis of generally accepted rules. As per Agenda 21, there are numerous indicators have been proposed to date to meet the criterion of policy relevance, analytical soundness and measurability which can be grouped variously. A first grouping draws from the Organization for Economic Co=operation and Development's (OECD's) Pressure-State-Response framework. Second grouping classification of indicators is according to main dimensions of sustainability as environmental, economic, social and integrated. Third is on the basis of spatial scale as global, national and local. Fourth is concerned with environmental medium like air, water, land etc. Finally indicators are grouped hierarchically as headline or core, local or basic, detailed or area specific. Most of the dimensions refer to a single dimension of sustainable development. These are State or Pressure indicator of OECD.

The pressure-state-response (PSR) framework follows as cause effect social response logic; it was followed by the OECD from earlier work by the Canadian government. Increasingly widely accepted and internationally adopted, it can be applied at a national level, at sectional level, at the levels of an industrial firm or at the community level. The PSR framework states that human activities exert pressures (such as pollution emissions or land use changes) on the

environment which can induce changes in the state of the environment. Society then responds to changes in pressures or state either environmental and economic policies or programs intended to prevent, reduce or mitigate pressures or environmental damage.

LET US KNOW

Agenda 21 is a non-blinding action plan of the United Nations with regard to sustainable development. It is an outcome of Earth Summit. It is a comprehensive plan of action to be taken globally, nationally and locally by organizations of the United Nations System.

10.6.1 Pressure Indicator

Pressure indicator means human activities, process and patterns that impact on sustainable development. Pressure indicator measure policy effectiveness more directly i.e. whether emissions increases or decreases, whether forest depletion waxes or wanes and whether human exposure to hazardous condition grows or shrinks. It is a flow variable. They show development overtime of amounts of emissions, discharges, disposition, extractions and interventions originating from a set of economic activities. Environmental pressures relates to pressures from human activities extracted on the environment, including natural resources. Pressures cover underlying or indirect pressures which act as driving forces for environmental issues as well as proximate or direct pressures. Indicators of environmental pressures are closely related to production and consumption pattern, they often reflect emission or resource use intensities, along with related trends and changes over a given period. They can be used to show progress in meeting national objectives and international commitments.

10.6.2 State Indicator

State indicator indicates state of sustainable development. This indicator reflects the impact of the environmental pressure on the receptor on a predetermined region. It also includes imported transboundary pressures. It shows the development overtime of stocks and the quality of environment. Environmental conditions relates to the quality of the environment and the related effects or impacts and the quality and quantity of the natural resources. They cover ecosystem and natural environment condition as well as quality of life and human health aspects. As such they reflect the ultimate objectives of

environmental policies. Indicators of environmental conditions are designed to give an overview of the situation concerning the environment and development over time.

10.6.3 Response Indicator

Response indicator indicates policy options and other responses to the changes in state of sustainable development. It measures progress toward regulatory compliances or other governmental efforts, but do not directly tell what is happening to environment. Societal response shows the extent to which society responds to environmental concerns through environment, general, economic and sectoral policies and through changes in awareness and behavior. They refer to individual and collective actions and reactions that are intended to mitigate, adapt or to prevent human induced negative effects on environment. Again it wants to preserve and conserve natural resources and the environment.

Examples of the indicator can be cited as increasing pollution level (Pressure indicator) causes ozone layer depletion (State indicator). It leads to imposition of taxes on polluting industries (Response indicator). Again the rate of deforestation (Pressure indicator) leads to a change in the biomass (State indicator). Reforestation measures should be taken as a measure.

CHECK YOUR PROGRESS

Q 5: Define pressure indicator. (Answer in about 50 words)

Q 6: What is response indicator? (Answer in about 30 words)

10.7 MEASUREMENT OF SUSTAINABLE DEVELOPMENT

The United Nations Conference on Sustainable Development recommends on measuring sustainable development. It identified twenty themes of indicator covering environmental, social and economic aspects of sustainable development: subjective well-being, consumption and income, nutrition, health, housing, education, leisure, physical safety, trust, institutions, energy resources, mineral resources, land and ecosystems, water, air quality, climate, labour, physical capital, knowledge capital, and financial capital as a measure of sustainable development. Population has been added as a contextual indicator.

The concepts of economy and its sustainability have a long history. Measurement of the economy goes back many centuries, but the modern version has its origin in the period of the

great depression in the 1920s and 1930s. “A System of National Accounts and Supporting Tables, Studies in Methods” was first published in 1953. In the 1950s and 1960s an influential environmental movement emerged in response to increasing concerns about the detrimental effects of economic production on the environment. This led to many initiatives to correct the concept of gross domestic producr and other macroeconomic aggregates to provide a better indicator for social and other welfare, or sustainable welfare.

The concept of sustainable development made an international breakthrough when the Report of the United Nations World Commission on Environment and Development (WCED) *Our Common Future* was published in 1987 (WCED, 1987). While the Brundtland report is usually credited with the conceptualization of sustainable development, the United Nations conferences in Rio (1992) and Johannesburg (2002) both provided a major impetus to the measurement of sustainable development. The composite indicators developed in the 1990s by a number of economists built on the work started in the 1960s and 1970s. Another type of composite indicator also emerged during this period, the roots of which do not lie in the accounting framework of SNA. Examples of such indicators are Human Development Index (HDI), Ecological footprint (EF), Happy Planet Index (HPI), the Sustainable Society Index (SSI) and the Living Planet Index (LPI).

10.8 LET US SUM UP

- The term sustainable development began to gain with acceptance in the late 1980s after its appearance in Our Common Future also known as the Brundtland Report. According to Brundtland Commission (1987) sustainable development is that which meets the needs of the present without compromising the ability of future generation to meet their own needs.
- Sustainable development attempts to accelerate development in an environmentally responsible manner keeping in mind the inter- generational and intra generational equity requirements.
- The first use of the term sustainable in modern sense was by the Club of Rome in 1972 in its epoch-making report on the ‘Limits to Growth’. The first ‘UN and UNEP World Conference on Human Environment’ was held in Stockholm in 1972. It had the slogan of ‘only one earth’ i.e. Our Common Future.
- ‘UN Sustainable Development Summit’ (2015), published 17 Millennium Development Goals which should be achieved by 2030 relating to sustainable development.
- The three important components or aims of sustainable development are, economic sustainability, social sustainability and ecological sustainability.

- The concept of weak sustainability is based upon the work of Nobel Laureate Robert Solow and Hartwick. The weak sustainability states that human capital or produced capital can be substituted by natural capital.
- The strong sustainability states that human capital and natural capital are complementary, but not interchangeable.
- The indicators of sustainable development can be stated as the Organization for Economic Co=operation and Development's (OECD's) Pressure-State-Response framework; secondly environmental, economic, social and integrated; thirdly on the basis of spatial scale as global, national and local and fourthly on the basis of environmental medium like air, water, land etc. Finally indicators are grouped hierarchically as headline or core, local or basic, detailed or area specific.
- The United Nations Conference on Sustainable Development recommends on measuring sustainable development identified twenty themes of indicator covering environmental, social and economic aspects of sustainable development: subjective well-being, consumption and income, nutrition, health, housing, education, leisure, physical safety, trust, institutions, energy resources, mineral resources, land and ecosystems, water, air quality, climate, labour, physical capital, knowledge capital, and financial capital as a measure of sustainable development.
- The concept of sustainable development made an international breakthrough when the Report of the United Nations World Commission on Environment and Development (WCED) *Our Common Future* was published in 1987.

Examples of some composite indicators are Human Development Index (HDI), Ecological footprint (EF), Happy Planet Index (HPI), the Sustainable Society Index (SSI) and the Living Planet Index (LPI).

10.9 FURTHER READING

(1) R. Bhattacharjee, *Environmental Economics*, OUP

(2) Hanley, Shrogram and White, *Introduction to Environmental Economics*, OUP

(3) G. Purakayastha, *Environmental Economics: Theory Problems and Solutions,* Kalyani Publishers

(4) Burhagohain and Das, *Environmental Economics*, EBH Publishers

10.10: ANSWRES TO CHECK YOUR PROGRESS

Ans to Q No 1: Sustainable development has been defined differently by different commissions. Yet the widely accepted definition is given by Burndtland Commission (1987). It stated that sustainable development iswhich meets the needs of the present without compromising the ability of future generation to meet their own needs.

Ans to Q No 2: True

Ans to Q No 3: The weak sustainability states that human capital or produced capital can be substituted by natural capital.

Ans to Q No 4: The strong sustainability states that human capital and natural capital are complementary, but not interchangeable.

Ans to Q No 5: Pressure indicator refers to flow variable. They show development overtime of amounts of emissions, discharges, disposition, extractions and interventions originating from a set of economic activities. Environmental pressures relates to pressures from human activities extracted on the environment, including natural resources.

Ans to Q No 6: Response indicators shows the extent to which society responds to environmental concerns through environment, general, economic and sectoral policies and through changes in awareness and behavior.

10.11 MODEL QUESTIONS

Short Questions (Answer each question in about 150 words)

Q 1: Write the aims of sustainable development in brief.

Q 2: Discuss the indicators of sustainable development.

Q 4: Discuss the strong and weak sustainability with suitable example.

Essay type Questions (Answer each question in about 300-500 words)

Q 1: Write in brief the history of sustainable development.

Q 2: What is PSR? Describe.

Q 3: Write a note on the measurement of sustainable development.

REFERENCES:

1. H. M. Saxena, *Environmental Geography*, Rawat Publications.
2. TomislavKlarin (2018): 'The Concept of Sustainable Development: From its Beginning to the Contemporary Issues', *Zagreb International Review of Economics & Business,* 21(1) pp 67-94

3. UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE : Conference of European Statisticians Recommendations on Measuring Sustainable Development, New York and Geneva2014