DEVELOPMENT ECONOMICS

COURSE CODE: B21EC04DE
Discipline Specific Elective Course
Undergraduate Programme in Economics
Self Learning Material

SREENARAYANAGURU
OPEN UNIVERSITY

SREENARAYANAGURU OPEN UNIVERSITY
The State University for Education, Training and Research in Blended Format, Kerala

SREENARAYANAGURU OPEN UNIVERSITY

Vision

To increase access of potential learners of all categories to higher education, research and training, and ensure equity through delivery of high quality processes and outcomes fostering inclusive educational empowerment for social advancement.

Mission

To be benchmarked as a model for conservation and dissemination of knowledge and skill on blended and virtual mode in education, training and research for normal, continuing, and adult learners.

Pathway

Access and Quality define Equity.

Development Economics

Course Code: B21EC04DE

Semester - V

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(With Model Question Paper Sets)

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MESSAGE FROM VICE CHANCELLOR

Dear learner,

I extend my heartfelt greetings and profound enthusiasm as I warmly welcome you to Sreenarayanaguru Open University. Established in September 2020 as a state-led endeavour to promote higher education through open and distance learning modes, our institution was shaped by the guiding principle that access and quality are the cornerstones of equity. We have firmly resolved to uphold the highest standards of education, setting the benchmark and charting the course.

The courses offered by the Sreenarayanaguru Open University aim to strike a quality balance, ensuring students are equipped for both personal growth and professional excellence. The University embraces the widely acclaimed "blended format," a practical framework that harmoniously integrates Self-Learning Materials, Classroom Counseling, and Virtual modes, fostering a dynamic and enriching experience for both learners and instructors.

The university aims to offer you an engaging and thought-provoking educational journey. The undergraduate programme in Economics is designed to be on par with the high-quality academic programmes offered at state universities throughout the country. The curriculum incorporates the latest methodologies for presenting economic ideas and concepts. It stimulates students' interest in developing a deeper comprehension of the discipline. The curriculum encompasses both theoretical concepts and historical evidence. Suitable emphasis is placed on India's experiences with economic transformation. This would aid learners in preparing for competitive examinations, should they choose to take them. Upon successfully completing the programme, we anticipate that students will be well-equipped to handle key areas within the economics discipline. The Self-Learning Material has been meticulously crafted, incorporating relevant examples to facilitate better comprehension.

Rest assured, the university's student support services will be at your disposal throughout your academic journey, readily available to address any concerns or grievances you may encounter. We encourage you to reach out to us freely regarding any matter about your academic programme. It is our sincere wish that you achieve the utmost success.

Regards,
Dr. Jagathy Raj V. P.

01-08-2025

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BLOCK

Concepts of Growth and Development

UNIT

Economic Growth and Development

Learning Outcomes

After completing this unit, the learner will be able to:

- define economic growth and development
- know economic development
- distinguish between economic growth and development
- brief the core values of development

Prerequisites

Consider a small, rural village where agriculture serves as the primary source of income for its residents, yet access to essential services such as education, healthcare, and markets is severely limited. In this scenario, economic growth is sparked when the government invests in constructing a new road that connects the village to a nearby city, thereby increasing the village's income as farmers can now easily transport and sell their produce in the city market. This rise of income enables villagers to purchase more goods and services, improving their standard of living. However, economic development includes a broader spectrum of progress, extending beyond mere economic growth to include significant enhancements in education, healthcare, and living standards. This demands the establishment of better educational institutions, hospitals, and infrastructure, ultimately leading to a marked improvement in the overall quality of life for the villagers. As a result, they not only enjoy higher incomes but also benefit from improved well-being, increased opportunities, and a more equitable distribution of resources, thus bridging the gap between economic growth and meaningful development.

Keywords

Growth, Development, Self-Esteem, Self-Sustenance, Freedom, International Trade

Discussion

1.1.1 Economic Growth and Development-Definition

Economic growth is primarily driven by economic considerations, but non-economic factors such as values, attitudes, and institutions, both domestic and foreign, also play a significant part in the entire development process. The ethical or normative value premises about what is or is not acceptable are key characteristics of development economics, and it should be stressed at the outset.

1.1.1.1 Economic Growth

Growth, according to Simon Kuznets, is defined as a rise in per capita or per-worker product over time. 'Economic growth occurs when output expands faster than population', according to Douglass North, another Nobel laureate. Here, the term 'output' is used in a broad sense to refer to all commodities and services that people use, whether or not they are generally documented in formal national product metrics. Economic growth includes improvements in health, the arts, personal safety, and a variety of other difficult-to-quantify products and services. Economic growth refers to a wide range of social and economic improvements that increase the amount of real per capita production accessible to a country's citizens. That is, economic growth refers to the entire process of generating more per capita output.

Economic growth is critical because an economy's ability to meet human desires is its bottom line. Focusing on how and why individual welfare varies over time is the only technique to study economic growth that makes sense. As a result, modern economists describe economic growth as an increase in human welfare. The growth process includes an increase in welfare-enhancing output. That is, economic growth needs growing the economy's capacity to meet the demands and requirements of its citizens.

Economic development is not simply a matter of doing more of the same. It is a structural transformation that affects all aspects of production, consumption, and trade. The agricultural and trade industries, as a percentage of total output, are the smallest in economies with the greatest per capita output levels, while the service sectors are the largest. The agriculture sector has a decreasing relative size the greater the amount of per capita output and income. When an economy's per capita output rises, it appears that the industrial sector, which includes manufacturing, mining, construction, and utilities (water, electricity, gas, and so on), climbs as a proportion of total value of output at first. However, as per capita output approaches that of today's high-income economies, the relative size of the industrial sector reduces.

There are various factors that influence the structural changes. They are:

- **Changes in Consumer Actions:** People's consumption patterns change as their incomes rise. The majority of income gains over the basic subsistence level are spent on luxury products, services, and recreational (leisure-time) items, which are not consumed at all by low-income people.

- **Change in Production Pattern:** As the economy grows and people's income rises, the production pattern changes as well. In fact, an economy expands as it learns to perform tasks more efficiently. The returns on productive factors increase as methods and technology improve. Furthermore, advances in physical and human capital supplement labour, improving each worker's production. Better working conditions, such as a more comfortable work environment, air conditioning, safer working conditions, more vacation time, and more flexible work hours, account for a portion of the increase in labour pay.

- **International Trade:** The structural shift that comes with economic expansion is frequently accentuated by international trade. As economies become wealthier, they tend to change their pattern of international specialisation because certain forms of industry can better adjust to shifting labour and capital costs. An expanding economy begins to import more labour-intensive goods while exporting more capital-intensive and technologically advanced goods. The importance of structural change in the process of economic growth is highlighted by the fact that the fastest-growing economies are those that have expanded foreign trade.

1.1.1.2 Economic Development

Growth simply refers to the increase in output, whereas development encompasses all aspects of the economy, including the social, political, and institutional changes that come with it. The two processes of 'growth' and 'development', on the other hand, are complementary. There is no incompatibility between them. There can be no sustained economic growth without significant changes in the economy and society, and it's impossible to imagine any significant progress without an improvement in the economy's ability to generate welfare-enhancing goods and services.

Development is a complex concept that involves improving the overall quality of life, encompassing economic growth, social progress, and better living conditions. It includes providing essential needs like food, shelter, healthcare, and education, as well as reducing poverty and inequality. In essence, development aims to create a happier and more fulfilling life for everyone. After World War II, the world was divided into three blocs: the First World (Western democracies), the Second World (communist states), and the Third World (developing countries). The Third World countries, despite gaining political independence, remained economically dependent on industrialised nations, leading to 'dependent economies' with distorted development, where the growth of some countries resulted in the underdevelopment of others. The concept of dependency suggests that Third World countries' development is controlled by decisions made outside their borders, often by advanced countries. This leads to underdevelopment, characterised by reliance on foreign technology, capital, and imports. External factors, rather than internal ones, drive global development patterns. Despite efforts from rich

countries and organisations like the World Bank and UNDP, many developing countries remain underdeveloped, highlighting the complexity of development.

Economic development in all communities, according to Todaro, has three basic goals/core values:

1. To improve the availability and spread of fundamental life-sustaining products such as food, clothing, shelter, health, and personal and private property protection.

2. To improve living standards by providing better jobs, educational opportunities, and a greater focus on cultural and human values. These, which are aided by rising revenues, have two goals: (i) to improve material well-being and (ii) to boost individual and national self-esteem.

3. To broaden the economic and social options open to individuals and countries. This can be accomplished by liberating them from all forms of enslavement and reliance, as well as from forces of ignorance and human sorrow.

At least three basic components or core values, according to Denis Goulet and his followers, should serve as a conceptual basis and practical guideline for producing an insightful development analysis. These three essential values, self-sufficiency, self-esteem, and freedom-represent universal ideals pursued by individuals and cultures around the world. They represent basic human wants in all nations and cultures throughout history.

1. Sustenance is defined as the Ability to Meet One's Basic Needs

The supply of basic requirements is what life-sustenance is all about. The World Bank pioneered the basic needs approach to human development in the 1970s. Human development is meaningless if a country cannot provide basic necessities such as housing, clothing, food, and education to its whole population. As a result, if a country is to completely develop, a significant goal of development strategy must be to lift people out of primary poverty while still meeting their basic necessities.

Food, shelter, health, and protection are all essential life necessities for everyone. Life would be impossible without them. A state of 'absolute underdevelopment' emerges when any of these are missing or substantially deficient in comparison to needs. Rising per capita incomes, the eradication of absolute poverty, the expansion of employment possibilities, and the reduction of income disparities are insufficient to achieve true economic growth. Economic development entails a rise in the standard of living. The supply of means to help people overcome their helplessness and unhappiness as a result of a lack of fundamental necessities of existence is a necessary but not sufficient prerequisite for growth.

The above viewpoint is identical to that of Amartya Sen. Human beings are born with specific potential skills, according to the United Nations Human Development Report of 1994, echoing Sen's viewpoint. The goal of development is to create an environment in which everyone can improve their abilities and improve their possibilities for current

and future generations. The true cornerstone of human growth is universalism, which recognises everyone's right to existence. The importance of wealth in human life cannot be overstated. However, focusing solely on it is incorrect for two reasons. To begin with, increasing riches is not required for the fulfilment of some critical human decisions. Second, human decisions go well beyond financial well-being.

2. Self-Esteem

Self-esteem is another common feature of a better existence. The feeling of self-respect and independence is important to self-esteem. If a country is exploited by others and lacks the capacity or influence to build economic connections on an equal footing, it cannot be considered fully developed. Developing countries must cultivate self-esteem in order to accomplish human progress. This means they must eliminate the feelings of dominance and reliance that are associated with colonialism and imperialism, as well as the resulting economic disadvantage. It refers to a sense of self-worth and respect for oneself. It demands men and women being recognised as human beings. As a result, human beings should not be used as a tool by others and should not be exploited.

3. Freedom

Freedom refers to the ability to choose one's fate in the face of the three evils of want, ignorance, and filth (living in inhumane conditions such as slums) or dirt. As the old adage says, 'Man is the architect of his own destiny, and God can only assist him in his endeavour.' Human progress, according to Amartya Sen, entails freedom, and for a person, freedom entails the ability to make choices. Human freedom, which is the final basic component of economic development, refers to freedom from material conditions of life as well as social servitude to nature, ignorance, other people, misery, institutions, and dogmatic beliefs, particularly the belief that one's poverty is predetermined. Economic progress entails more economic freedom for societies in terms of wider choices and a reduction in external limitations on individual behaviour.

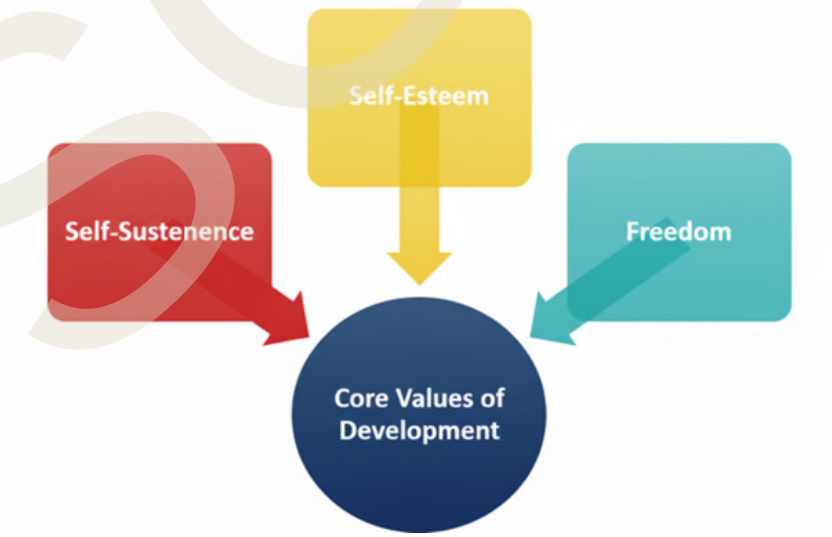

Fig. 1.1.1 Core values of Development

Goulet's three basic components of human progress are quite similar to Amartya Sen's definition of development, which is characterised in terms of the expansion of entitlements and capabilities, with the former providing life-sustainment and self-esteem and the latter providing freedom. Sen describes entitlements as 'the collection of alternative commodity bundles that a person in a society might command utilising the entirety of rights and obligations that he or she encounters, and entitlements generate the power to perform particular things.'

Human development, which is the only way to meet the demands of millions of poor people in emerging countries like India, is more than simply raising society's output (GDP) through growing production capacity. Instead, human development, which is the primary goal of economic development, should be thought of in terms of expanding entitlements and capabilities, which are not adequately reflected by aggregate output growth measurements. In LDCs like India, the bulk of people's entitlements are determined by their ability to sell their labour power as well as the prices of the commodities they supply in the market. It also depends on their ability to maximise the benefits of the government's assistance programmes. Income, in Sen's opinion, is frequently insufficient and unreliable as a measure of entitlement. He tries to explain this argument by bringing up the global occurrence of famines. He discovered that most famines are linked to a lack of entitlements rather than a lack of food. Famines are, in other words, the result of entitlement failure.

1.1.3 Distinction between Growth and Development

The terms 'economic development' and 'economic growth' are interchangeable. A gain in national or per capita income and product is referred to as economic growth. Economic growth is defined as an increase in the production of goods and services in a country, regardless of how it occurs. Economic development needs fundamental changes in the economy's structure as well. The rising share of industries in national product, as well as the declining share of agriculture in national product, are two of the most significant structural changes (which gels reflected in an increasing percentage of people living in cities rather than in the countryside). The transition from agriculture to industry to services was identified by Simon Kuznets as a virtually uniform pattern of growth. As the economy grows, food demand grows more slowly than income, shifting demand to manufactured commodities and stimulating increased investments, firms purchasing machines, in that sector. Infrastructure (transport, communication, and education) consumes a bigger percentage of a country's resources, while production in all areas becomes more complex. Although services are important in all economies, their scope evolves over time, from mostly personal to more comprehensive business and financial services.

Manufacturing increased faster than GNP in most industrialised nations, causing these economies to undergo the inevitable structural transition that diminishes the amount of income earned and labour employed in agriculture. According to Todaro 'In the past, economic development was often seen in terms of the planned adjustment of the structure of output and employment so that agriculture's proportion of both drops and that of the manufacturing and service industries increases,'. As a result,

most development strategies have emphasised fast industrialisation. Furthermore, countries that succeed in developing go through periods of increasing, then decelerating population growth, during which the population's age structure shifts substantially. Consumption patterns shift when people shift their spending away from essentials and toward consumer durables, and then toward tourism and recreation (called leisure-time products and services).

One of the most important aspects of economic development is that the people of the country must be active participants in the process that led to these structural changes. This requires both sharing in the benefits of development and increasing the production of tangible goods and services. Economic development will not exist if only a small wealthy minority profits from it. While economic development and modern economic growth requires more than an increase in per capita income or product, no progress is possible without economic growth

Economic development necessitates not only growth, but also structural changes in output, such as shifts in the composition of sectors and industries.

Development can be defined as the creation of an economy that is sufficiently flexible, diversified, and resilient to withstand weather shocks; that can respond to and even create new opportunities for progress; and that is capable of generating continuously improving well-being for its people through its own efforts. Economic development involves 'sustained and sustainable growth in per capita income, supported by diversification of output, reduction of absolute poverty, and expanding economic possibilities for all residents,' according to Stuart R. Lynn. The definition stipulates that economic growth must outpace population increase, but it also includes several warnings. Sustainable growth suggests that the process can be sustained over time, implying that the nation's land and resources must not be deteriorated to the point of causing an environmental crisis. Diversification of production is expanding the range of goods and services produced, rather than simply producing more of the same. To reduce absolute poverty, the poorest members of society must share the advantages of growth. Expanding opportunities for everyone means more freedom in terms of labour, consumption, and leisure.

Growth refers to an increase in output or income,whereas development encompasses economic, social, and institutional changes that improve the overall quality of life. Growth is a narrower concept that focuses on quantitative measures, such as GDP growth, whereas development is a broader concept that emphasises qualitative improvements in standard of living, education, healthcare, and poverty reduction.While growth can occur without significant changes in the economy's structure, development involves a structural transformation of the economy and aims to improve the well-being of all individuals. Growth is a necessary but not sufficient condition for development, which prioritises enhancing overall well-being and expanding economic opportunities for all.

Recap

- Economic growth and development are two distinct yet complementary concepts
- Growth refers to an increase in output or income, focusing on quantitative measures like GDP growth
- Development includes economic, social, and institutional changes that improve the overall quality of life, emphasising qualitative improvements in standard of living, education, healthcare, and poverty reduction
- While growth can occur without significant structural changes, development involves a structural transformation of the economy, aiming to improve well-being and expand economic opportunities for all
- The core values of development include sustenance (meeting basic needs), self-esteem (feeling of self-respect and independence), and freedom (ability to make choices)
- Economic development is a complex process that requires sustained and sustainable growth, diversification of output, reduction of absolute poverty, and expanding economic possibilities for all residents
- Development prioritises improving overall well-being, and growth is a necessary but not sufficient condition for achieving this goal

Objective Questions

1. What is economic growth?
2. Who defined economic growth as "a rise in per capita or per worker product over time"?
3. What is economic development?
4. According to Todaro, what are the three core values of development?
5. What does self-esteem refer to?
6. According to Amartya Sen, what is development characterised by?

7. What is the relationship between economic growth and development?
8. What is the significance of structural change in economic development?
9. According to Stuart R. Lynn, what is economic development?
10. What is the role of individual choice and freedom in economic development?

Answers

1. Increase in per capita income
2. Simon Kuznets
3. Structural changes in the economy
4. Self-sufficiency, self-esteem, and freedom
5. Sense of self-respect and independence
6. Expansion of entitlements and capabilities
7. Economic growth is a necessary but not sufficient condition for economic development, and economic development is not possible without economic growth
8. Changes in production, consumption, and trade patterns
9. Sustained and sustainable growth in per capita income
10. Important for expanding economic opportunities

Assignments

1. Define economic growth and economic development. How do they differ?
2. "All growth is not development, but all development includes growth." Discuss this statement with suitable examples.
3. Compare the quantitative and qualitative aspects of economic growth and development. Why is development considered a broader concept?

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Suggested Reading

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UNIT 2

Measures of Development

Learning Outcomes

After completing this unit, the learner will be able to:

- comprehend various indicators of economic development
- discuss a country's overall development progress
- know the measures of development
- compare various measures of development

Prerequisites

Development experts employ various measures to assess a country's progress beyond economic indicators, including the Physical Quality of Life Index (PQLI), Human Development Index (HDI), Human Poverty Index (HPI), Gender Development Index (GDI), and Multidimensional Poverty Index (MPI). PQLI focuses on basic needs like literacy, infant mortality, and life expectancy, providing insight into a population's overall well-being. HDI takes a more comprehensive approach, evaluating long-term progress in health, education, and income to assess a nation's well-being. In contrast, HPI measures deprivation in fundamental aspects like health, education, and living standards, highlighting areas where development is lagging. GDI adjusts HDI to account for gender disparities, revealing differences in development between men and women. Meanwhile, MPI examines multiple deprivations individuals face simultaneously, including poor health, inadequate education, and substandard living conditions, offering a complex understanding of poverty. By utilising these measures, policymakers can identify specific development challenges and design targeted interventions to improve the lives of their citizens, ultimately promoting more equitable and sustainable development.

Keywords

PQLI, HDI, HPI, GDI, Multi-dimensional Poverty Index, GNI, Per Capita Income, Literacy Rate

Discussion

1.2.1 Measures of Development

Development consists of the removal of various types of unfreedoms that leave people with little choice and little opportunity of exercising their reasoned agency. The removal of substantial un-freedoms, it is argued here, is constitutive of development' (Amartya Sen, 2001). Because development has many aspects and indicators, it is measured differently from one country to the next and from one subject to the next. Literacy rates, maternity and infant mortality rates, and access to basic needs such as housing, drinking water, sanitation, communication, energy for cooking and lighting are all well-known indices of development. When these and other indicators are considered, the concerns and challenges of development, particularly in developing nations, become apparent. Poverty, income inequality, unemployment, and inflation are posing overwhelming problems to these economies and have a significant impact on the people's quality of life in such countries. The emphasis on development has shifted dramatically in response to shifts in these attitudes and challenges. The indicators of economic development are listed below.

1.2.1.1 Gross National Income (GNI)

During the 1950s, GNP was used to analyse economic development. GNP growth is intended to increase the availability of products and services to a larger portion of the population, resulting in increased living standards. The UN passed a resolution setting a target growth rate of 5% for LDCs. However, during the 1960s, this strategy was subjected to a number of criticisms. The following are some significant criticisms:

An increase in Gross National Product (GNP) or Gross Domestic Product (GDP) does not necessarily translate to greater availability of goods and services or improved economic welfare. Several limitations exist: population growth can offset increases in GNP, leading to stagnant or decreased per capita income; GDP calculated at current prices may rise due to inflation rather than increased production; production for self-consumption may be excluded from GDP, causing underestimation. Moreover, GDP growth achieved at the expense of labor welfare, such as longer working hours, does not reflect true economic welfare. Increases in GDP from capital goods may benefit future welfare but not the present, while growth from defense goods or harmful products like liquor and cigarettes does not contribute to economic welfare. Furthermore, if GDP growth only benefits a small wealthy group while leaving the majority in poverty, it fails to indicate overall economic welfare. Therefore, GDP has its limitations as a comprehensive measure of economic well-being.

1.2.1.2 Per Capita Income

From the 1970s, the emphasis shifted from the growth rate in GNP to per capita income. An increase in per capita real income is taken as an indicator of economic welfare.

$$PCI = \frac{NationalOutput}{LabourForce} X \frac{LabourForce}{Population}$$

However, this also has its limitations as follows:

a. Per capita income does not show the distribution of GDP, whether it is equally distributed or unequally distributed.

b. It does not reflect the kinds of goods and services that are being produced and consumed in society. It may be so that the economy is producing pedigree, anti-ageing creams on the one hand, and 26% people are living below the poverty line, as it is happening in India.

c. Economic Welfare also depends on the quality of public goods.

1.2.1.3 Core-Indicators of Development

At the end of the 1970s, there was a rising dissatisfaction with income-based economic development indicators because they were quiet on the developing inequality issues. As a result, the United Nations Research Institute on Social Development chose the most appropriate development indicators and examined their relationships at various levels of development. This was a different technique of measuring economic progress. The following is a list of key indicators of socio-economic development:

a. Percentage of the economically active population with electricity, gas, water, etc.

b. Agricultural production per male agricultural worker

c. Percentage of adult male labour in agriculture

d. Electricity consumption, kw per capita

e. Expectation of life at birth

f. Consumption of animal protein

g. Combined primary and secondary enrolment

h. Average number of persons per room

i. Newspaper circulation per 1,000 population

1.2.1.4 Physical Quality of Life Index (PQLI)

Morris David Morris is known for developing the Physical Quality of Life Index (PQLI). The Physical Quality of Life Index (PQLI) is a comprehensive measure that assesses the well-being of a population by focusing on three fundamental aspects of physical well-being. They are:

1. **Literacy Rate:** This component reflects the ability of individuals to read and write, which is a crucial skill for personal development, education, and participation in the economy. A higher literacy rate indicates a more educated and informed population.

2. **Infant Mortality Rate:** This indicator measures the number of deaths of infants under one year of age per 1,000 live births. It is a sensitive indicator of the overall health and well-being of a population, particularly the most vulnerable segment. Lower infant mortality rates suggest better healthcare services, sanitation, and living conditions.

3. **Life Expectancy at Age One:** This component measures the average number of years a person is expected to live after reaching the age of one. It reflects the health and mortality conditions of a population beyond infancy. Higher life expectancy indicates better healthcare, nutrition, and living standards.

The PQLI combines these three indicators into a single index value, scaled from 0 to 100, where:

- 0 represents the worst possible performance.

- 100 represents the best possible performance.

The equation for calculating PQLI index is given below;

$$PQLI = \frac{Life\ Expectancy\ Index + Infant\ Mortality\ Index + Literacy\ Rate}{3}$$

The significance of the PQLI lies in its focus on basic human needs and outcomes rather than economic indicators alone. It provides policymakers and researchers with a tool to evaluate the effectiveness of development policies and interventions aimed at improving the well-being of populations. By emphasizing literacy, health, and longevity, the PQLI offers a more nuanced view of development that goes beyond economic metrics like GDP.

1.2.1.5 Human Development Index (HDI)

The Human Development Index (HDI) was created by the United Nations Development Programme (UNDP) in 1990 to provide a measure of economic development in three main areas: per capita income, health, and education. HDI was created by Amartya Sen, an Indian Nobel Laureate, and Mahbub-ul-Haq, a Pakistani economist. Its mission was to put people at the centre of economic discourse, policy, and advocacy in the development process. The inaugural Human Development Report,

released by UNDP in 1990, began with the phrase, 'People are a nation's actual wealth.' The HDI is a great way to compare countries' development levels. GDP per capita is unquestionably too restrictive an indicator of economic development, as it fails to convey the full picture of progress.

HDI measures average achievements in a country in three basic dimensions of human development, viz., a long and healthy life; access to knowledge; and a decent standard of living. Performance in each dimension is expressed as a value between 0 and 1 by applying the following formula

$$Index = \frac{Actual\ Value - Minimum\ Value}{Maximum\ Value - Minimum\ Value}$$

For each of the variables, predetermined minimum and maximum values are used to create the index. The range for life expectancy at birth is 25-85 years. Adult literacy rates range from 0% to 100%. The range of real per capita income is $100 to $10000. The index is 0 if the variable's actual value is the minimum. The index is one if the actual value equals the maximum value. Let's look at the case of India's expectation. The average lifespan is 61.3 years, which we can calculate using equation (I) as (61.3 - 25) / (85 - 25) = 36.3 / 60 = 0.60. Some developing countries' HDIs are significantly greater than their PCIs, and vice versa.

The overall index is the combination of three indices, viz.

a. Life Expectancy Index (LEI)

b. Education Attainment Index (EAI)

c. Decent Standard of Living Index (SLI), measured by GDP per capita

Fig. 2.1.1 Human Development Index

The overall index is a geometric mean of three indices

$$HDI = \frac{LEI + IMI + EAI}{3}$$

The HDI measures changes in a country's level of development over time. However, HDI has some drawbacks, including the fact that the three indicators it uses are good

but not optimal. It does not directly consider income distribution. Because the index is relative rather than absolute, the findings it produces may be misleading.

1.2.1.6 Inequality Adjusted-HDI

The Human Development Index (HDI) is corrected for inequality in the distribution of each dimension across the population using the Inequality-adjusted Human Development Index (IHDI). The IHDI takes into account inequalities in HDI dimensions by 'discounting' the average value of each dimension based on its level of disparity. If there is no disparity between people, HDI equals IHDI. When there are inequalities, however, the value of IHDI is always lower than HDI. This means that the IHDI represents the actual level of human development (accounting for inequality), but the HDI is an index of 'potential' human development (or the highest level of HDI) that could be achieved if there were no disparity.

1.2.1.7 Human Poverty Index (HPI)

Poverty is a complex, multidimensional phenomenon that extends beyond the lack of income. To capture the broader dimensions of human deprivation, the Human Poverty Index (HPI) was introduced by the United Nations Development Programme (UNDP) in 1997. Developed as a complement to the Human Development Index (HDI), the HPI aimed to measure poverty in terms of access to essential human capabilities, such as health, education, and a decent standard of living. By doing so, it offered a more holistic view of poverty and human deprivation.

The HPI was designed to reflect the proportion of people suffering from a lack of basic human development, not just from income poverty. Recognising that people may be deprived even with modest incomes, the HPI focused on outcomes rather than inputs. It was published annually in the UNDP's Human Development Reports until it was replaced by the Multidimensional Poverty Index (MPI) in 2010.

There were two versions of the HPI:

HPI-1 was used for developing countries and focused on three dimensions:

- Longevity: The probability at birth of not surviving to age 40.
- Knowledge: Adult illiteracy rate.
- Standard of living: Access to safe water, health services, and the percentage of underweight children under five.

HPI-2 was developed for high-income, developed countries and adapted to their context:

- Longevity: Probability of not surviving to age 60.
- Knowledge: Adults lacking functional literacy skills.
- Standard of living: Long-term unemployment rate.

- Social exclusion: Population living below the poverty line (50% of median income).

The HPI introduced an innovative way to think about poverty, emphasising deprivation in essential human capabilities rather than just economic means. It shed light on the fact that even countries with relatively high income levels could have significant portions of their populations suffering from non-income-related deprivation. It was a significant move away from income-centric measurements like GDP per capita and allowed policymakers and researchers to focus on the root causes of poverty and exclusion.

However, while the HPI was a major step forward, it had certain limitations. It used only a few indicators, and the choice of indicators was criticised for being arbitrary. The Multidimensional Poverty Index (MPI) replaced the HPI in 2010 to address these limitations by using more nuanced and extensive datasets, including ten indicators across health, education, and living standards.

In conclusion, the Human Poverty Index represented an important shift in the understanding of poverty—from a narrow focus on income to a broader view of human deprivation. Though now replaced by the MPI, the HPI played a foundational role in highlighting the multidimensional nature of poverty and remains significant in the evolution of development economics and policy.

1.2.1.8 Gender Related Development Index (GDI)

The Gender related development index (GDI) measures gender inequalities in achievement in three basic dimensions of human development as follows:

a. Health is measured by female and male life expectancy at birth.

b. Education is measured by female and male expected years of schooling for children and female and male mean years of schooling for adults aged 25 and older.

c. Command over economic resources, measured by female and male estimated earned income.

The score depicts the loss of human development as a result of disparities in female and male accomplishment in certain areas. It runs from 0 to 1, with 0 indicating that women and men do equally well in all measured dimensions and 1 indicating that women perform as poorly as possible in comparison to their male counterparts. A new index, the Gender Inequality Index (GII), was proposed to address the GDI's shortcomings. Reproductive Health, Empowerment, and Labour Market Participation are the three components of this indicator.

1.2.1.9 Multi-Dimensional Poverty Index (MPI)

The Multidimensional Poverty Index (MPI) identifies numerous deprivations in health, education, and standard of living at the individual level. It bases deprivation of cooking fuel, toilet, water, electricity, floor, and assets on micro data from household

surveys. Depending on the quantity of deprivations experienced by his or her household, each individual is classed as poor or non-poor. The data is then combined to create a national measure of poverty. The following are the indicator thresholds for determining whether or not a home is deprived:

Education: School Attainment: No household member has completed at least six years of schooling.

School Attendance: A school-age child (up to grade 8) is not attending school.

Health: Nutrition: A household member (for whom there is nutrition information) is malnourished, as measured by the body mass index for adults (women ages 15-49 in most of the surveys) and by the height-for-age score calculated using World Health Organisation standards for children under age 5.

Child Mortality: A child has died in the household within the five years prior to the survey.

Standard of Living: The Standard of Living is assessed based on key indicators like no access to electricity, limited clean drinking water, poor sanitation, use of 'dirty' cooking fuel, living in a home with a dirt floor, and lack of assets for info access, mobility, or livelihood. The Multi-Dimensional Poverty Index calculation reveals that despite recent poverty reductions, over 2.2 billion people remain near or living in multidimensional poverty.

Recap

- Economic development is a multifaceted concept that cannot be measured solely by economic indicators like Gross National Income (GNI) or per capita income
- Over time, the emphasis has shifted from purely economic metrics to more comprehensive indicators that include health, education, and standard of living
- The Physical Quality of Life Index (PQLI) and the Human Development Index (HDI) are examples of such measures, aiming to capture the quality of life and human well-being more accurately
- The HDI, in particular, assesses long and healthy life, knowledge, and a decent standard of living
- The limitations of PQLI and HDI can be complemented by other measures like the GDI, HPI, GDI, and MPI.

Objective Questions

1. What is a significant criticism of using GNI as a development indicator?
2. What is the primary focus of the Human Development Index (HDI)?
3. Which index adjusts the HDI for inequality in the distribution of health, education, and income?
4. What are the three basic dimensions of human development measured by the HDI?
5. What is the purpose of the Physical Quality of Life Index (PQLI)?
6. Which index measures multidimensional deprivations in health, education, and standard of living?
7. What is the focus of the Gender-related Development Index (GDI)?
8. Which three components are included in the Human Development Index (HDI)?
9. The Multidimensional Poverty Index (MPI) replaced which earlier poverty measure developed by UNDP?
10. Which development index focuses specifically on gender disparities in health, education, and income?

Answers

1. Increase the availability of products and services
2. A long and healthy life, access to knowledge, and a decent standard of living
3. HDI for inequality
4. A long and healthy life, access to knowledge, and a decent standard of living
5. Literacy rate, infant mortality, and life expectancy
6. Multidimensional deprivations

7. Gender inequalities in achievement in health, education, and command over economic resources

8. Health, education, and standard of living

9. Human Poverty Index (HPI)

10. Gender-related Development Index (GDI)

Assignments

1. Compare and contrast the Physical Quality of Life Index (PQLI) and the Human Development Index (HDI) as measures of development.

2. Analyse the Human Poverty Index (HPI) and its significance in measuring deprivation in basic dimensions of human development.

3. Discuss the importance of the Gender Development Index (GDI) in assessing gender disparities in human development.

4. Explain the concept of the Multidimensional Poverty Index (MPI) and its advantages over traditional income-based poverty measures.

5. Evaluate the effectiveness of using a combination of development indices, such as PQLI, HDI, HPI, GDI, and MPI, to assess a country's development progress.

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UNIT

Growth and the Capability Approach

Learning Outcomes

After completing this unit, the learner will be able to:

- comprehend the concept of human development
- discuss the relationship between economic growth and human development
- familiarise with Amartya Sen's capability approach
- know about the role of freedom in development

Prerequisites

Human development is about improving people's lives by giving them more choices and opportunities. It is not just about economic growth, but about helping people lead fulfilling lives. Amartya Sen's capability approach emphasises that development should focus on enhancing people's capabilities and freedoms. This means giving people the chance to do things they value and want to do. There are different aspects of human development, including living a long and healthy life, getting an education, and having a decent standard of living. Economic growth can help achieve these goals, but it is not the only thing that matters. What is most important is that people have the freedom to make choices and live the life they want. By focusing on human development, we can enhance people's lives and create a more equitable society. Ultimately, human development is about giving people the opportunities and freedoms they need to live a life they value.

Keywords

Economic Growth, Human Development, Sen's Capability Approach, Political Freedom, Life Expectancy, Environmental Sustainability

Discussion

1.3.1 Growth versus Human Development

Economic growth refers to the increase in an economy's production of goods and services over time, typically measured by Gross Domestic Product (GDP) or Gross National Income (GNI). Key indicators include GDP growth rate and per capita income. The focus areas for economic growth include investment, production, consumption, savings, and infrastructure development. By boosting investment, increasing production, and promoting consumption and savings, economies can expand their productive capacity, leading to higher output and income levels. Infrastructure development also plays a critical role in supporting economic activity and growth, ultimately contributing to a nation's prosperity.

Human development is about expanding people's choices and opportunities to lead a long, healthy, and fulfilling life. It encompasses three key dimensions:

1. Life Expectancy: Living a long and healthy life.
2. Education: Access to knowledge and learning opportunities.
3. Standard of Living: Having a decent income to meet basic needs.

The Human Development Index (HDI) measures these dimensions to assess a country's progress in human development. This concept, promoted by Amartya Sen and the UNDP, prioritises people's well-being and capabilities over mere economic growth.

A country's progress is measured not only by its economic growth but also by its human development. Economic growth refers to the increase in a nation's wealth and income, typically measured by its Gross Domestic Product (GDP). On the other hand, human development encompasses the well-being of its citizens, including their health, education, and standard of living.

Economic growth is crucial for a country as it provides the resources needed to invest in vital sectors such as healthcare, education, and infrastructure. However, economic growth alone does not guarantee an improvement in the quality of life for all citizens. If the benefits of growth are not distributed equitably, certain segments of the population may not experience any significant improvements in their lives.

Human development is about enhancing the lives of individuals and providing them with opportunities to reach their full potential. It is not just about financial prosperity but also about access to quality healthcare, education, and a decent standard of living. Human development is assessed through various indicators such as life expectancy, literacy rates, and income levels. When human development improves, people are healthier, better educated, and more productive, contributing positively to their country's growth.

1.3.1.1 Relationship between Economic Growth and Human Development

There is a significant relationship between economic growth and human development. Investing in human development, such as education and healthcare, can lead to a more skilled and productive workforce, which in turn can drive economic growth. Conversely, economic growth can provide the necessary resources to invest in initiatives that promote human development. For instance, a strong economy enables a country to build better educational institutions, healthcare facilities, and infrastructure, thereby improving the lives of its citizens.

Both economic growth and human development are vital for the progress of a country. Economic growth provides the means to invest in human development, while human development ensures that people can contribute effectively to the economy and improve their own lives. Policymakers should aim to strike a balance between promoting economic growth and investing in human development. By doing so, they can create a society that is not only prosperous but also equitable, where everyone has the opportunity to thrive.

In short, economic growth and human development are two sides of the same coin, each crucial for the advancement of a nation. While economic growth provides the resources, human development focuses on utilising these resources to enhance the lives of citizens. A balanced approach to both is key to creating a prosperous and equitable society.

Table 1.3.1 Difference between Economic Growth and Human Development

Aspect	Economic Growth	Human Development
Definition	Increase in the output of goods and services (GDP/GNP).	Expansion of people's capabilities and improvement in the quality of life.
Focus	Quantity – income, production, and output.	Quality – health, education, well-being, and freedom.
Measurement Tools	GDP, GNP, per capita income.	HDI (Human Development Index), life expectancy, literacy rate, etc.
Nature	Narrow and monetary.	Broad and multidimensional.
Objective	To achieve higher economic productivity and wealth.	To ensure people's overall well-being and development.
Assumption	Growth will eventually lead to improved living standards (trickle-down effect).	Direct investment in health, education, and empowerment is essential.

Timeframe	Short to medium term focus.	Long-term sustainable progress.
Inequality and Distribution	May increase inequality if growth is not inclusive.	Aims for equity and inclusive development.
Role of People	People are seen more as a means of production.	People are the end goal of development.
Key Proponents	Classical and neoclassical economists.	Amartya Sen, UNDP, and development economists.

1.3.1.2 Redefining Development

A new perspective on development emerged, concentrating on social and community development. Following Amartya Sen's work on capacities and entitlement, which he characterised as "the enlargement of people's options," human development in the mid-1980s emerged with the notion of development as capacitating.

Amartya Sen, in his book *Development as Freedom*, says that millions of people—whether in rich or poor countries—still live without real freedom. They face problems like poverty, lack of basic needs, political oppression, or strict social rules that limit their choices.

He explains that real development means increasing people's actual freedoms. To achieve this, we must remove the main things that take away freedom—like poverty, lack of education, or political control. Sen points out that development is not just about growing the economy, increasing incomes, building industries, or advancing technology. While these things can help improve freedom, they are not enough on their own.

If we agree that development is about giving people more freedom, then our focus should be on that broader goal, not just on the tools we use to get there. When we look at development as expanding real freedoms, we pay more attention to what truly matters in people's lives, not just how fast the economy is growing.

Sen believes that freedom is essential to the development process for two reasons:

A. **The Evaluative Reason:** Progress must be measured primarily in terms of whether people's liberties are being expanded.

B. **The Effectiveness Reason:** Development is entirely dependent on people's free will.

1.3.2 Development as Freedom: Sen's Capability Approach

Sen's idea of development as freedom is based on the "capability approach". He argues that progress should not be judged mainly by how much money people have or how fast the economy grows, but by how much freedom and opportunity people actually enjoy. According to him, what really matters is whether people have access to the goods and services they need, and whether they have real choices in life. These

choices depend a lot on the political system and how it supports people's rights and freedoms. Therefore, to better understand development, we need to look at what people are entitled to and how their abilities to live the life they value are shaped by the political systems around them.

Sen's idea of development as freedom means that development is a process of removing the obstacles that stop people from living the kind of life they value. At the same time, making efforts to expand freedom in different areas of society also helps the development process.

This way of thinking helps us focus on how development tools and policies can support human freedom. It makes the link between the goals of development and the ways to achieve them clearer. This approach is broader and more inclusive than simply seeing progress as economic growth, industrialisation, or scientific and technological progress. Sen suggests that by viewing development as freedom, we shift our attention to what truly matters to people—their real goals in life—rather than just the usual methods used to reach them. So, in this view, development depends on freedom. Therefore, it is necessary to discuss the specific tools and methods used to achieve development. The following are the instrumental freedoms identified by Sen:

a. Economic Opportunities

b. Political Freedom

c. Social Facilities

d. Transparency Guarantees

e. Protective Security

The role of instrumental freedoms is closely connected to a person's ability to act and make choices. The range and quality of these freedoms in a person's life affect how much real freedom they have. True freedom can be understood through a person's capabilities—what they are actually able to do or be. So, development is seen as a process of building and improving these capabilities. Each type of right or opportunity adds to a person's overall ability to live the life they value. These different freedoms also support each other through public policies. When we promote these related freedoms together, we help improve both human capabilities and meaningful freedom. Every person has a set of things they want to do or become. These goals, from basic needs to complex ambitions, are called functionings. A person has a mix of these functionings in their life. One way to check if a person's freedom has increased is to see how many of these functionings they have achieved. Another way is to look at the different combinations of functions they are free to choose from.

The number and scope of options accessible to a person to attain what he values are then used to assess freedom. The 'capability set' of a person is made up of the various combinations that are available to him at any one time. A person's capability refers to the many combinations of functions that he or she is capable of achieving. Capability is thus a kind of freedom to attain different functional combinations, or, to put it another way, 'the freedom to live different lives'. As a result, the degree of achievement of

functioning in a combination, as well as the availability of alternative combinations of functioning from which a person might realistically hope to pick, can be used to evaluate freedom. Although these metrics are frequently integrated in development practice, Sen believes that choosing between choices indicates a higher sense of freedom.

It is evident that a person's functioning and capabilities are related yet distinct in this case: A capability is the ability to achieve, whereas a functioning is an achievement. Because they are distinct components of living situations, functioning is more directly tied to living conditions. Capabilities, on the other hand, are positive concepts of freedom: "what true opportunities you have regarding the life you may lead." Functioning is included in capacity sets, but while functioning gives us an idea of what a person has actually accomplished at a given point in time, capability gives us hints about sets of these accomplishments that people can choose from. This is significant because, in their daily lives, people combine their wellbeing successes and attempt to order and prioritise them. In this way, capability sets provide a clear image of the actual possibilities available to a person, as well as the power he has to choose among them. Capability sets so point to and provide a greater purchase on comprehending something wider than a person's unique achievements of wellbeing: it denotes the person's freedom.

Sen's ideas on economic development, social fairness, and human rights are woven together into a coherent vision of a better future. 'Values, institutions, development, and liberty are all inextricably linked.' He ties them all together in an analytical framework to look at the social foundations of people's happiness. He demonstrates that the quality of our life should be evaluated by our freedom rather than our wealth.

Recap

- Economic growth is the increase in a country's production of goods and services over time, typically measured using GDP or GNI
- The Human Development Index (HDI) includes life expectancy, education, and per capita income to measure development quality
- Economic growth does not automatically result in improved living standards. Growth without equity can increase inequality
- Economic growth uses GDP/GNP, while human development uses HDI, literacy rates, and life expectancy to assess progress
- In economic growth, people are seen as producers or labourers. In human development, people are the central goal of development
- Amartya Sen redefined development as a process of expanding people's freedoms and capabilities, not just income growth

- Sen identifies five instrumental freedoms: economic opportunities, political freedom, social facilities, transparency guarantees, and protective security
- Functionings are achievements (e.g., being healthy), while capabilities are the real freedoms or opportunities to achieve those functionings
- According to Sen, development should be evaluated by the expansion of individual freedoms rather than by material output alone
- True progress requires a balance between economic growth and human development to build a prosperous and equitable society

Objective Questions

1. What is economic growth typically measured by?
2. Which economist is known for promoting the concept of "development as freedom"?
3. What are the three key dimensions of human development according to HDI?
4. According to Sen, what is the primary goal of development?
5. Which of the following freedoms is not identified by Sen as an instrumental freedom?
6. What does Sen's capability approach focus on?
7. What is the difference between "functioning" and "capabilities" in Sen's approach?
8. According to Sen, what is the significance of capability sets?
9. How does Sen's approach to development differ from traditional views?
10. What is the ultimate goal of development according to Sen's capability approach?

Answers

1. Gross Domestic Product (GDP) or Gross National Income (GNI)
2. Amartya Sen
3. Life expectancy, education, and GNI per capita
4. Enhancing people's freedoms
5. Environmental sustainability
6. Enhancing people's capabilities and freedoms
7. Functioning refers to actual achievements, while capabilities refer to potential achievements
8. They represent the range of choices available to a person
9. It focuses on enhancing people's freedoms and capabilities
10. To enhance people's freedoms and capabilities

Assignments

1. Discuss the concept of "development as freedom" as proposed by Amartya Sen. How does it differ from traditional views of development?
2. Analyse the relationship between economic growth and human development. How do they complement each other?
3. What are the key dimensions of human development according to the Human Development Index (HDI)? Explain each dimension in detail.
4. Describe Sen's capability approach and its significance in understanding development. How does it emphasise the importance of freedom?
5. Evaluate the relevance of Sen's concept of development as freedom in addressing contemporary development challenges.

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BLOCK

Growth Models and Empirics

UNIT

Classical Theories of Growth

Learning Outcomes

After completing this unit, the learner will be able to:

- comprehend Classical ideas about economic growth
- distinguish among the theories of classical economists
- discuss the strengths of classical theories
- describe the limitations of classical theories

Prerequisites

Why do countries grow? Why are there poor countries? Why are there rich countries? Can poor countries be rich? If they cannot, why? If they can, why are they still poor? As Robert Lucas put it, "Once you start thinking about growth, it's hard to think about anything else."Development Economics and growth models try to give you an answer to these questions. Now, let's begin with Classical Growth models.The classical growth theory was developed by (mostly British) economists during the Industrial Revolution. Classical growth theory explains economic growth as a result of capital accumulation and the reinvestment of profits derived from specialisation, the division of labour, and the pursuit of comparative advantage. The classical economists were able to provide an account of the broad forces that influence economic growth and of the mechanisms underlying the growth process. A basic understanding of key concepts of microeconomics and macroeconomics is useful for a proper understanding of Classical Growth models.

Keywords

Laissez-faire, Division of Labour, Constant Capital, Diminishing Returns, Organic Composition of Capital, Variable Capital, Stationary State

Discussion

2.1.1 Classical Theories of Growth

Classical theories of economic growth, developed by 18th and 19th-century economists such as Adam Smith, David Ricardo, and Thomas Malthus, provide the foundational ideas for understanding how economies expand over time. These theories emerged during the Industrial Revolution and focused on the key drivers of growth: capital accumulation, the division of labor, and population dynamics. Unlike later models that would emphasize technology, classical thinkers saw economic expansion as being primarily limited by factors like diminishing returns on land and a population's tendency to outgrow its food supply, leading to the idea of a "stationary state" where growth would eventually halt. In essence, these theories set the stage for modern economic thought by systematically exploring the long-term prospects of capitalist economies..Let us discuss the common features of the classical growth models

2.1.1.1 Features of Classical Growth Theory

The following are the important characteristics of Classical Growth Theory:

1. **Laissez-Faire Policy:** The term Laissez-faire means, in French, "allow to do" or "let them be free." According to classical economists, the focus is on the Laissez-faire policy, which advocates minimal government intervention in the economic affairs of individuals and society. They believed that the economy functions best when individuals are allowed to pursue their own self-interest without government interference

2. **Division of Labour:** Division of labour, the separation of a work process into a number of tasks, with each task performed by a separate person or group of persons. It will increase efficiency and productivity in the system.

3. **Capital Accumulation:** This is the process of acquiring additional capital stock, which is used in the productive process. Capital accumulation can involve investment in physical fixed capital (e.g. factories, machines)

4. **Profit is the Motive behind Investment:** Profit is the primary driving force behind most investment decisions. Investors allocate their capital to opportunities where they anticipate returns that outpace risks and inflation. The prospect of profit stimulates businesses to innovate, expand, and improve operational efficiencies, thereby attracting further investments. Ultimately, the pursuit of profit not only benefits individual investors but also fuels broader economic growth by supporting job creation and technological advancement.

5. **Free Trade:** Free trade, also called laissez-faire policy. Free trade is a policy by which a government does not discriminate against imports or interfere with exports by applying tariffs (to imports) or subsidies (to exports). A free-trade policy does not necessarily imply, however, that a country abandons all control and taxation of imports and exports.

6. **Stationary State:** It is the halting point of economic growth. A stationary state is one in which growth is neither positive nor negative. Until John Stuart Mill, the stationary state was, like the declining state, considered unwelcome, and growth was thought to benefit all three great classes of society: capitalists, landlords, and workers.

2.1.2 Adam Smith (1723-90)

Smith was born in Scotland and was a leading figure during the Scottish Enlightenment. He was known as the Father of Economics, the Father of Capitalism and the Founder of the Classical School. He was a professor at Glasgow University, where he taught moral philosophy. Scottish economist Adam Smith was the leading figure of the classical theory of growth. His theories were a challenge to the mercantilists, and he was influenced by the ideas of Physiocrat. From the two books of Adam Smith, namely the 'Theory of Moral Sentiments' (1759) and 'Wealth of Nations' (1776), we can assimilate the growth and development ideas put forward by Smith. Technically speaking, Smithian Theory is the first development theory in Economics.

2.1.2.1 Adam Smith's Theory of Economic Development

Adam Smith is regarded as the leading classical economist. His monumental work, *An Enquiry into the Nature and Cause of Wealth of Nations* published in 1776, was mainly concerned with the problem of the economics of growth and development. His theory is known as the Theory of Growth and Stagnation. The main crux of this theory is the investigation of the role of capital accumulation. Even though his theory is not systematic, it provides foundation for development economics.

2.1.2.2 Assumptions

1. Population growth was endogenous. It depended on the sustenance available to accommodate the increasing workforce.

2. Investment was also endogenous; determined by the rate of savings (mostly by capitalists);

3. Land growth was dependent on the conquest of new lands (e.g. colonisation) or technological improvements in the fertility of old lands.

4. Technological progress can also contribute to overall growth. Smith's famous thesis,i.e,that the division of labour, or specialisation, enhances growth,was a fundamental argument

5. Smith also saw improvements in machinery and international trade as engines of growth, as they facilitated further specialisation.

6. He also assumed the existence of perfect competition.

2.1.2.3 Main Features

a. Naturalism

Smith is associated with two words: "Naturalism and Optimism. Naturalism refers to the idea that economic institutions are natural and spontaneous in their origin. Naturalism is a way of thinking that focuses on the natural world and its rules. It says that everything can be explained by natural laws and principles, without supernatural forces. Naturalism influences education, encouraging learning through experiences and senses. It also shapes our views on morality and human existence, promoting understanding through observation and evidence.

Optimism,on the other hand, is a mental attitude that encompasses a positive outlook on life, characterised by hope, confidence, and resilience. Optimists expect good things to happen, believe in their ability to overcome challenges, and approach difficulties with a proactive and solution-focused mindset. This attitude can have numerous benefits, including improved mental and physical health, stronger relationships, and greater success in personal and professional endeavors. Optimism is not about ignoring problems or challenges, but rather about facing them with a positive and empowered mindset, and believing that better outcomes are possible. By cultivating optimism, individuals can develop a more fulfilling and meaningful life, and build the resilience needed to navigate life's challenges with confidence and hope.

In the wealth of a nation, the concept of naturalism is combined with optimism. It clearly indicates the importance of laissez-faire policy – let them be free. According to him, natural laws are superior to state laws, which means minimal government Intervention. Man is motivated by self-interest or self-love. Smith called it hedonistic principles. Man has always tried to maximise his gain and minimise his pain. This is evident from his very famous quotation.

b. Division of Labour

Adam Smith's Division of Labour means breaking down work into smaller, specialised tasks, with each person focusing on one task. Division of labour increases productivity, which depends upon the size of the market. It is the division of labour that results in the greatest improvement in the productive powers of labour. The attributes of this increase in productivity are:

i. The increase in the dexterity of every worker.

ii. The saving in time to produce goods.

iii. The inventions of a large number of labour-saving machines.

The last cause of the increase in productivity stems not from labour, but from capital. Therefore in Smith's scheme; it is improved technology that leads to division of labour which, however, depends on the size of the market.

c. Capital Accumulation

Adam Smith's concept of capital accumulation refers to the process of gradually increasing the stock of capital through savings, investments, and productive activities.

This accumulation of capital enables businesses, industries, and economies to grow, innovate, and become more productive. Smith argued that capital accumulation is driven by the savings of individuals and businesses, which are then invested in productive endeavors such as manufacturing, trade, and infrastructure. As capital accumulates, it can lead to increased economic efficiency, higher profits, and improved living standards. Smith saw capital accumulation as a key driver of economic development and a crucial factor in the growth of nations. By accumulating capital, societies can increase their productive capacity, expand trade and commerce, and improve their overall economic well-being. Adam Smith believed that only the wealthy, like capitalists and landlords, could save and invest because they had more than enough money. In contrast, workers, who earned just enough to survive, couldn't save or invest due to low wages, limiting their contribution to economic growth i.e,this idea was based on the "Iron Law of Wages'

d. Production Function

Adam Smith's production function emphasises division of labor, specialisation, and capital accumulation as key drivers of productivity and economic growth.Smith recognised three factors of production, namely labour, capital and land, i.e.

$$Y = f(K, L, N)$$

Where, K = Stock of Capital L = Labour force N = Land

The production function operates under assumptions of returns to scale depending on market expansion, often tending towards constant returns in classical models.

e. Trade Cycle

Adam Smith didn't focus much on trade cycles, but he noted that economies can experience fluctuations due to changes in demand, supply, and external factors like wars or natural disasters. He mainly emphasised long-term economic growth through specialisation and investment.According to Smith,economic development is not a sudden or abrupt process, but it is a gradual or cumulative process. (So his theory is known as the Theory of Gradualism). It starts with division of labour and is propelled by capital accumulation, and ends with the stationary state.

f. Stationary State

It is the halting point of economic development. It is the last stage of economic growth. It is the ceiling of economic growth. According to Smith, "The increase in the national output was eaten away by the growth of population that leads to the stationary state". In this stage, wages are at subsistence level, and profit is zero. Smith does not provide any valid solution to escape from the stationary state. So Smith's stationary state is called the gloomy stationary state.

2.1.2.4 A Critical Appraisal of the Smithian Model

Smith's model has the great merit of pointing out 'how economic growth came about and what factors and policies impede it'. In particular, he pointed out the importance of parsimony in saving and capital accumulation; of improved technology, division of labour and expansion of market in production; and of the process of balanced growth in the interdependence of farmers, traders and producers. Despite these merits, it has certain weaknesses.

1. **Rigid Division of Society:** Smith's theory is based on the socio-economic environment prevailing in Great Britain and certain parts of Europe. It assumes the existence of a rigid division of society between capitalists (Including landlords) and labourers. But the middle class occupies an important place in modern society. Thus, this theory neglects the role of the middle class.

2. **One-Sided Saving Base:** According to Smith, Capitalists, landlords, and money lenders save. This is, however, a one-sided basis of saving because it did not occur to him that the major source of savings in our advanced society was the income receivers and not the capitalists and landlords.

3. **Unrealistic Assumption of Perfect Competition:** Smith's whole model is based upon the unrealistic assumption of perfect competition. The laissez-faire policy of perfect competition is not to be found in any economy. Rather, a number of restrictions are imposed on the private sector, and internal and international trade in every country of the world.

4. **Neglect of Entrepreneur:** Smith neglects the role of the entrepreneur in development. This is a serious defect in his theory. The entrepreneur is the focal point of development, as pointed out by Schumpeter. It is the entrepreneur who organises and brings about innovations, thereby leading to capital formation.

5. **Unrealistic Assumption of Stationary State:** Smith is of the view that the end result of a capitalist economy is the stationary state. It implies that there is a change in such an economy, but around a point of equilibrium. There is progress, but it is steady, uniform and regular like a tree. But this explanation of the process of development is not satisfactory because development takes place by 'fits and starts' and is not uniform and steady. Thus, the assumption of a stationary state is unrealistic.

2.1.3 David Ricardo (1772-1823)

David Ricardo was born in London in a Jewish family. He was one of the most influential of the classical economists along with Thomas Malthus, Adam Smith and James Mill. Ricardo was also a politician and a member of the Parliament.

2.1.3.1 Ricardian Theory of Economic Development

Ricardo presented his view on Economic Development in an unsystematic manner in his book *The Principles of Political Economy and Taxation*, which was published in 1817. Like Smith, Ricardo never propounded any theory of development; he simply discussed the Theory of Distribution. However, Smith's model of growth remained the predominant model of Classical Growth. David Ricardo (1817) modified it by including diminishing returns to land.

2.1.3.2 Assumptions

The assumptions of his model are:

a. All land is used for the production of corn

b. The law of diminishing returns operates

c. Supply of land is fixed

d. Demand for corn grows with population but is not perfectly elastic

e. Labour and capital are variable inputs

f. State of technical knowledge is given

g. All workers are paid a subsistence wage

h. Supply price of labour (subsistence wage) is assumed constant.

i. Demand for labour depends upon accumulations

j. Capital accumulation results from profit

k. There is perfect competition

2.1.3.3 Main Features of Ricardian Model

The Ricardian model is based on the interrelation of three groups in the economy. They are landlords, capitalists and labourers among whom the entire produce of land is distributed, i.e. rent, profit, and wages.

a. Rent: It is that portion of the produce of the earth which is paid to the landlord for the use of original and indestructible powers of the soil. According to Ricardo, rent is determined by the difference in fertility between land. Rent is not a cost of production but rather a surplus earned by landlords due to the scarcity and varying quality of land.As labour is added to a fixed plot of land, output increases at a decreasing rate, illustrating diminishing returns. The difference in productivity between the best and marginal land determines the rent, which landlords earn due to the superior productivity of the best land. As the economy expands and more land is cultivated, rent increases because the productivity gap between the

best and marginal land widens.As profits decrease due to diminishing returns, rent increases, as landlords capture the surplus value created by the scarcity of land.As profits approach zero, investment and growth cease, and the economy reaches a stationary state.

b. The Wage Rate: It is determined by the wage fund divided by the number of workers employed at the subsistence level. According to the model, out of the total corn produced, rent has the first right, and the residual is distributed between wage and profit, while interest is included in profit.

2.1.3.4 Capital Accumulation

According to Ricardo, capital accumulation is the outcome of profit because profit leads to the saving of wealth, which is used for capital formation. Capital formation depends upon the will to save and the capacity to save, which is more important. The larger the surplus, i.e. profit, the larger will be the capacity to save.

i. **The Profit Rate:** The rate of profit is equal to the ratio of profit to capital employed. But since capital consists of only working capital, it is equal to the wage bill. So long as the rate of profit is positive, capital accumulation will take place. In reality, profits depend upon wages, wages on the price of corn and the price of corn depends upon the fertility of the marginal land. So there is an inverse relation between wages and profits. When due to improvement in agriculture, production increases, the price of corn falls, and subsistence wages also fall, and profits will increase, leading to capital accumulation. This will raise demand for labourers, raising the wage rate and reducing profits.

ii. **Increase in Wages:** The wage rate increases when the prices of commodities forming the subsistence of the workers increase. As the demand for food increases, less fertile land is brought under control, and more labourers are needed, raising the wage rate. Thus, wages would rise with the increase in the price of corn. In a situation where rent also increases, with the decline of capitalists' profit, capital accumulation also declines.

iii. **Declining Profits in other Industries:** The profits of the farmer regulate the profits of all other trades. Therefore, the money rate of profit earned on capital must be equal both in agriculture and industry. If the profit rate declines in the agricultural sector, it will also decline in the manufacturing industry.

2.1.3.5 Other Sources of Capital Accumulation

According to Ricardo, economic development depends upon the difference between production and consumption. Capital may be increased by an increase in production or by a decrease in unproductive consumption. However, the productivity of labour may be increased through technological changes and better organisation. It is in this way that capital accumulation can be increased. But the use of more machines employs fewer workers, leading to unemployment. So Ricardo regards technological conditions as given and constant.

a. **Taxes:** Taxes are a source of capital accumulation in the hands of the government. According to Ricardo, taxes are to be levied to reduce conspicuous consumption. Otherwise, the imposition of taxes on capitalist landlords and labourers will transfer resources from these groups to the government, adversely affecting investment. So he does not favour the imposition of taxes.

b. **Free Trade:** Ricardo is in favour of free trade. The profit rate can be saved from declining by importing corn. The capital accumulation, therefore, continues to be high. In this way, the resources of the world can be used more efficiently through trade.

2.1.3.6 Stationary State

According to Ricardo, there is a natural tendency for the rate of profit to fall in the economy so that the country ultimately reaches the stationary state. When capital accumulation rises, with an increase in profits, production increases, which raises the wage fund, and population increases, which raises the demand for corn and its price. Inferior grades of land are cultivated. Rents on superior land increase and reduce the share of the capitalists and labourers. Profits decline and wages fall to subsistence. The process of rising rents and falling profits continues till the output from the marginal land just covers the wages of labour employed, and profits are zero. There is no accumulation of capital, no increase in population and wage rate, but rent is extremely high, and there is economic stagnation.

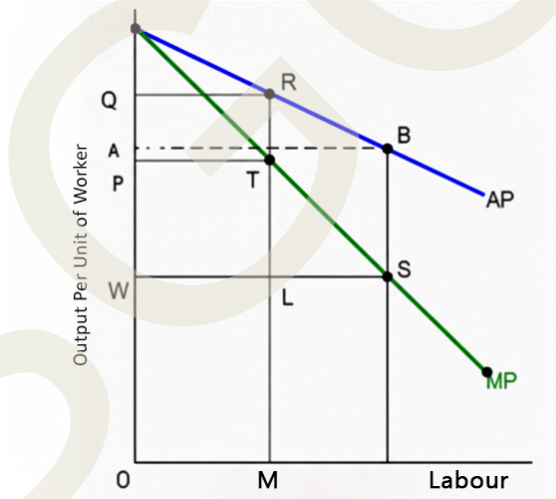

Fig. 2.1.1 Stationary State

In the figure2.1.1, AP and MP represent average product and marginal product of labour, OWLM is at the subsistence level. Total profits are WPTL. OM labour is employed. OQRM corn is produced. Share of rent is PQRT, and Total output increases with economic development. This leads to an increase in the wage fund, leading to an increase in the amount of labour. Demand for corn goes up, raising the price of corn. OM1 labour is employed, total output is OABM1, and there are no profits. Share of rent has increased.

2.1.4 Thomas Robert Malthus(1766-1834)

Thomas Robert Malthus was the first person to criticise Say's law of the market and disagreed with classical ideas. His famous works are *An Essay on the Principle of Population* (1798) and *Principles of Political Economy* (1820).

2.1.4.1 Malthusian Theory of Population

It is a well-known theory about the growth of population introduced in his famous book *An Essay on the Principle of Population*. This theory discusses the relationship between the population and food supply. His theory is based on the law of diminishing returns. In plain language, the theory states that population increases at a faster rate than the food supply.

According to Malthus, "population increases in a Geometric Progression (2, 4,8,16.....) While food production increases only in Arithmetic Progression (2, 4, 6,8,10.....). Malthus believed that the population of a country, when unchecked, would double itself every 25 years. But the food supply will not increase as fast as the population. This occurred because of diminishing returns to land. This situation is called the "Malthusian trap" or "Malthusian catastrophe".

Thomas Malthus argued that population growth is limited by food supply, and when population exceeds food availability, "positive checks" like starvation, disease, and death, and "preventive checks" like delayed marriage and lowered birth rates, kick in to balance the population. He believed that any efforts to improve living standards by increasing income or agricultural productivity would be futile, as the extra resources would be consumed by a growing population. Malthus claimed that society's "perfectibility" is unattainable due to this tendency. He defined the problem of development as the gap between a country's potential wealth and its actual wealth, emphasising that economic growth is not automatic and requires more than just population growth. In fact, population growth is a result of economic progress, and an increase in population requires a corresponding increase in wealth, making economic growth a complex and multifaceted process.

It is clear that population growth alone does not guarantee that either the population or income will continue to grow. The author gives examples such as Spain, Portugal, Hungary, Turkey, and most of Asia, Africa, and America to show this point. Simply having more people does not automatically lead to economic growth. Population growth can support development only when it leads to an increase in effective demand.

If a person only has their ability to work, they will only find employment if there is demand for their labour by those who control resources and production. This demand for labour depends on how fast capital is being accumulated in the economy.

2.1.4.2 Effective Demand

Thomas Malthus developed a theory of effective demand, which was later echoed by economists like Keynes and Kalecki. He disagreed with "Say's Law," which stated

that the production of goods and services automatically generates enough demand to purchase them, and that saving is merely a way to invest in capital goods. Instead, Malthus argued that saving, or not consuming, actually reduces demand, leading to lower profits and investment. He highlighted a different kind of circular relationship, where national income is made up of profits and wages. In other words, businesses earn profits and pay wages, which in turn become the income that consumers use to purchase goods and services, generating demand and driving the economy. Malthus's ideas challenged the conventional wisdom of his time and anticipated some of the key concepts of modern economics. As we know that

$$\mathbf{O = R + W}$$

Where R = Profit Or

$$\mathbf{R = O - W}$$

W = Wages and O = National output

Since workers, as a class, are too poor to save, they spend all their income on consumption. Let us denote workers' consumption as Cw. Capitalists (Cc), however, do save; these savings create income insofar as they are invested.

So we may write,

$$\mathbf{R = (I + Cc + Cw) - Cw = I + Cc \ldots O = I + Cc + Cw}$$

National income or output is generated by investment, capitalists' consumption and workers' consumption. Profit are national income less wages; wages equal worker's consumption and so according to Malthus, profits are equal to investment plus capitalists' consumption.

2.1.4.3 Role of Capital

Malthus does not deny the need for saving and investment for economic growth. But he suggests a concept of 'optimum propensity to save'. Up to a certain point, saving is needed to finance (without inflation) the investment for which profitable opportunities exist. Beyond that point, however, savings will reduce. Consumer spending to such an extent that investment too will be discouraged. High rates of growth do not occur with high levels of ex-ante saving (abstinence) on the part of the upper income groups, but with high levels of ex-post (realised) savings and investment, which are to a large degree, the result of growth, and do not require reductions in consumer spending. Like Smith and Ricardo, Malthus also believed in free enterprise and considered that the wealth effects of free trade are very high.

2.1.4.4 Structural Change

Malthus observed that as economies develop, the importance of agriculture decreases, and other industries grow. He believed that technological advancements create jobs, but when economic growth slows down, unemployment rises. To increase production, Malthus suggested land reform, and he viewed the economy as consisting of two main parts: industry and agriculture, with agriculture driving the growth of industry.

Malthus envisioned economic development as a process where investors put money into agriculture until all usable land was cultivated. After that, investors turned to the industrial sector. To avoid decreasing returns in agriculture, technological progress in industry needed to be rapid, absorbing population growth and reducing workers' living costs. According to Malthus, the rate of technological progress in industry depends on the amount of capital available. He also recognised that inadequate investment can lead to unemployment, making industrial employment dependent on investment. As a result, industrial output can be seen as directly dependent on the amount of capital invested in the industrial sector.

$$Oi = a.\ Qi$$

Where Oi is the output of the industrial sector, Qi is the amount of capital in the industrial sector, and 1/a is the capital-output ratio for the sector.

According to Malthus, the growth of industrial output depends on the rate of capital accumulation, which in turn relies on the level of profits. Profits are influenced by the wage rate, which is tied to the cost of producing essential goods like food, and effective demand, driven by capitalists' consumption and investment. Malthus also highlighted the importance of sectoral interaction in underdeveloped areas. He noted that the industrial and agricultural sectors rely on each other as markets, so if one sector fails to grow, it hinders the growth of the other. This is why "balanced growth" is necessary for overall development. In underdeveloped countries, the industrial sector's growth is limited by the poverty of the agricultural sector. The agricultural sector remains poor because large landowners lack the incentive to cultivate their land more intensively due to limited market opportunities, while small-scale peasants lack the capital needed for efficient cultivation, preventing them from paying enough rent to convince landowners to rent out their land.

Thus, the industrial sector (including large-scale agriculture) remains limited in total size. Because of its land-and capital-intensive nature, it provides employment for relatively few people. The bulk of the population, meanwhile, lives in poverty by means of labour-intensive peasant agriculture, which provides no effective demand for further growth.

There is no doubt that Malthus made a valuable contribution to the theory of economic growth. This repudiation of say's law and emphasising the importance of effective demand and its relation to saving and investment are indeed noteworthy for their modern touch. A great deal of what he wrote on the subject is applicable to an underdeveloped economy, especially relating to the theory of dualism.

2.1.5 John Stuart Mill (1806 - 1873)

John Stuart Mill was born in London. His father, James Mill, was a Scottish philosopher and economist. He was a leading political philosopher of the Nineteenth Century. He held radical views for the time, advocating universal suffrage and equality for women. He was also a Utilitarian philosopher. In 1830, he met Harriet Taylor, who became a lifelong friend and companion. Mill had a strong belief that women should be treated equally and should be given the vote.

He is most famous for his book *Principles of Political Economy*, published in 1848, which became a leading economic textbook for decades. Other significant books include *On Liberty, A System of Logic, The Subjection of Women,* and *Utilitarianism.*

2.1.5.1 J.S. Mill's Theory of Economic Development

According to J.S. Mill, economic development is a function of labour, land, and capital. He considered land and labour as original factors of production, and capital as the stock previously accumulated from the production of labour. According to him, the wealth of a nation increases production faster than the labour force.

The important constituents of Mill's theory of development are:

i. **Control of Population Growth:** J.S Mill strongly believed in the Malthusian Theory of Population. According to him, the tendency of a population is to increase faster than the means of living. Thus, there is a need to curb population growth in order to bring faster development.

ii. **The Wage Fund:** Mill had an opinion that the elasticity of labour supply is very high in response to a rise in wages. Wages usually cross the subsistence level. Wages are paid out of capital, and, hence, they are limited by the existing fund of capital. Further, wages are determined by the demand and supply of labour. Any change in the wage rate is affected by the change in capital or population. Therefore, the increase and decrease in wages depend on whether capital grows faster than the population, or whether the population grows faster than capital. Mill pointed out that a rise in consumption leads to a decline in investment. On the other hand, a rise in investment leads to an increased wage fund, and this leads to economic development. Mill believed that the wage fund depends upon the aggregate fund of capital, and the wages that are paid out of capital as advances.

iii. **The Role of Capital Accumulation:** Capital is defined as the previously accumulated stock of the products of formal labour: the higher the capital, the larger the size of wages and thus, the higher the demand for productive labour. Capital is the result of savings, and savings mean abstinence from present consumption for the sake of future investment.

According to Mill, capital accumulation depends upon

i. the size of the fund that savings can make, and

ii. the strength of the disposition to save.

Thus, capital is the kingdom of development, and it is the upshot of investment.

iv. **The Rate of Profit:** According to Mill, the ultimate tendency in an economy is for the rate of profit to decline due to diminishing returns in agriculture, and an increase in the population at a Malthusian rate. In the absence of technical progress in agriculture, and with a high population growth rate, the rate of profit is bound to decline, and the economy will approach a stationary state.

v. **The Role of State:** J.S Mill was an ardent supporter of laissez-faire and advocated a minimum role for the state in economic affairs. Mill was in favour of free trade and against protectionism. He prescribed protection only for infant industries. In his view, the government has an important role in civilising citizens by providing educational facilities. However, he did not consider education as an investment in capital which stimulates economic growth.

vi. **The Stationary State:** The stationary state is a stage where there could be no increase in either population or in the stock of capital. Profit becomes minimal. However, there would still be a rise in the standard of living because of improvements in the lifestyle, and increased leisure through technical progress. According to J.S Mill, the stationary state is imminent. He advocated the stationary state as it leads to improvement, in income distribution, and large remuneration for labour.

2.1.5.2 The Stages of Limits to Growth

Mill identified five stages of economic growth, each characterised by a unique combination of population growth, capital accumulation, and technological progress. He also recognised that economic growth is subject to limits, which can lead to stagnation and decline.

Stage 1: When the population increases, capital and technology remain stationary. Real wages fall and rents increase.

Stage 2: Population stationary; capital rises and there is no change in technology; real wages rise, demand for food increases under conditions of diminishing returns, rents rise, but profits fall.

Stage 3: Population and capital increase equally, and the technology remains stationary; real wages remain constant, the profit rate will fall, and rents rise.

Stage 4: Population and capital stationary; technological progress; real wages rise, rents decline, and profits are unchanged.

Stage 5: Growth in population, capital and technology together. Here, only rents would increase.

Thus, Mill concludes that the economic development of a society constituted of landlords, capitalists, and labourers and leading to agricultural improvement tends to the progressive enrichment of landlords — which leads to agricultural improvement — tends to result in the progressive enrichment of landlords. Labourer's subsistence tends to rise and profits to fall. In contrast to his predecessors, Mill's idea of the stationary state was a virtue that had opened up possibilities in general and the elevation of the intellectual and social position of the working class and birth control.

2.1.5.3 Limitations of the Classical Growth Model

- **Ignorance with respect to Technology:** The classical model of growth ignores the role efficient technical progress can play in ensuring the smooth funtioning of an economy. Technological advancements can help minimise the effects of diminishing returns.

- **Inaccurate Determination of Total Wages:** The classical model of growth assumes that total wages do not exceed or fall below the subsistence level. However, this is not entirely true. Changes in the industrial structure and substantial economic development can result in total wages exceeding or falling below the subsistence level. Moreover, the classical theory of growth does not consider the role played by trade unions in the process of wage determination.

Recap

- Adam Smith, who is often considered the father of modern economics, started the school of thought that we now call classical
- Adam Smith discussed the importance of free trade and the division of labour in the process of economic development
- Ricardo's 'Theory of Development' is actually a theory of distribution and how Ricardo put forward the theory of diminishing returns to land and his theory of rent
- Malthus shows how population outstrip the rate of growth of the food supply, which will hinder economic growth
- Mill discussed the concept of investment and business cycles in the process of economic development.
- The falling rate of profit is the major reason for the falling economic growth
- The reasons why it was to eventually take place differed from economists to economist
- Ricardo, it was diminishing returns to land, for Malthus, it was the rate of growth of population

Objective Questions

1. Who is known as the father of modern economics?
2. Which classical economist introduced the concept of comparative advantage?
3. Who developed the theory of population growth that could outpace food production?
4. Which book did Adam Smith publish in 1776?
5. Which economist emphasised diminishing returns in agriculture?
6. Who formulated the subsistence theory of wages?
7. Which classical economist proposed that population grows geometrically while food grows arithmetically?
8. Which economist stressed the importance of capital accumulation in economic growth?
9. What is the title of Malthus's most famous work?
10. Who introduced the idea of the 'invisible hand' in market mechanisms?

Answers

1. Adam Smith
2. David Ricardo
3. Thomas Malthus
4. Wealth of Nations
5. David Ricardo
6. David Ricardo.
7. Thomas Malthus
8. John Stuart Mill
9. Essay on the Principle of Population
10. Adam Smith

Assignments

1. Describe the main feature assumptions of Adam Smith's theory of economic development?
2. Critically evaluate the strengths and weaknesses of Smith's theory of development.
3. State the assumptions of Ricardo's Theory of Development. Compare the Ricardian model with Adam Smith's Theory of Development.
4. Critically examine the contribution of Malthus to the Theory of Economic Development.
5. Describe J.S Mill's Theory of Economic Development and briefly state his views on the business cycles.

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UNIT 2

Neo-Keynesian Growth Models

Learning Outcomes

After completing this unit, the learner will be able to:

- comprehend the core concepts of the Harrod-Domar growth model
- identify and discuss the assumptions underlying the Harrod-Domar growth model
- differentiate between the warranted, actual and natural growth rates
- discuss limitations and criticisms of the Harrod-Domar model

Prerequisites

The Harrod-Domar model was developed in the 1930s and 1940s, amidst the Great Depression and World War II, aiming to provide a framework for understanding economic growth dynamics. Building on Keynesian economics, the model emphasises the role of aggregate demand, savings, and investment in driving growth. Key concepts include economic growth, savings, investment, capital-output ratio, and technological progress. Despite its limitations, the model remains relevant today, particularly in development economics and business cycle theory, offering insights into the challenges facing developing countries and the dynamics of economic growth, making it a foundational theory for understanding the complex interactions between savings, investment, and economic growth.

Keywords

Capital-Output Ratio, Savings, Investment, Actual Growth Rate, Warranted Growth Rate, Natural Growth Rate

Discussion

The evolution of economic thought has been deeply influenced by the challenge of understanding long-run economic growth. While classical and neoclassical economists emphasised supply-side factors and market equilibrium, Keynesian economics focused on demand-side constraints, especially during times of economic downturn. Building on this legacy, the Neo-Keynesian growth models emerged in the post-World War II period to reconcile Keynesian demand theories with long-term economic development. Among these, the Harrod-Domar model holds a central place as a foundational attempt to formalise growth dynamics using Keynesian principles. However, despite its historical significance, the model has been subject to extensive critique for its theoretical and practical limitations.

2.2.1 The Neo-Keynesian Perspective on Growth

The Neo-Keynesian school of thought aimed to bridge the gap between short-run macroeconomic instability and long-run economic growth. In this context, investment plays a dual role: it stimulates aggregate demand (as emphasised by Keynes) and also expands the productive capacity of the economy (a classical concern). Neo-Keynesian models incorporate rigidities, such as wage stickiness and imperfect competition, and allow for policy interventions to stabilise growth paths. These models often focus on aggregate demand as a driver of growth, especially in developing economies where savings and investment constraints are more binding.

2.2.2 Harrod–Domar Model

Harrod–Domar model is a simple growth model based on the Keynesian saving–investment equality. The main aim of the Harrod–Domar model is to dynamise or secularise Keynesian static short-run saving investment equality. The model analyses the requirement of steady state growth (balanced growth). The model was independently developed by Roy. F Harrod in 1939 and Evesy Domer in 1946. Both models are basically similar because both models analyse the requirement of steady state growth.

Harrod–Domar model is the pioneer of the exogenous growth model. Harrod–Domar model was initially developed for explaining the business cycle in an economy (Hicksian business cycle is based on Harrod–Domar model). Harrod–Domar model is also called Classical –Classical-Keynesian model of economic growth.

2.2.2.1 Assumptions of the model

1. Full employment in the economy(initially)
2. No government intervention
3. Closed economy
4. No time lag in the process of adjustment
5. Saving =Investment

6. MPS remain constant
7. APS=MPS
8. Constant Returns to Scale (capital)
9. Fixed proportion production function
10. Capital is the only factor of production
11. Neutral technical progress
12. Saving and investment are equal in both ex-ante and ex-post sense
13. Capital Output Ratio Remain constant

For the proper understanding of the model, it is essential to discuss Harrod and Domar model separately. Firstly, we discuss the Harrod model of economic growth.

2.2.2.2 Harrod Model (1939)

Harrod presented his theory in 'An Essay in Dynamic Theory' in The Economic Journal, which was published in the year 1939. His model is also called the capital and growth model because it assumes capital is the only factor of production. . Harrod model is a demand-oriented model because it is based on long-run Keynesian economics.

This model analysed the requirements of steady-state growth. Under steady state growth, Rate of growth of income is equal to the rate of growth of output, or in other words, the rate of growth of productive capacity is equal to the rate of growth of income.

There are three main issues or questions addressed in the model. They are:

1. How is steady-state growth achieved?
2. How steady-state growth maintained?
3. How do natural forces put a ceiling on the growth rate of the economy?

In order to discuss these three issues, Harrod had adopted three different concepts of growth rates: (i) the actual growth rate, G, (ii) the warranted growth rate, G_w (iii) the natural growth rate, G_n.

- Actual growth rate G
- Warranted growth rate G_w
- Natural growth rate G_n

Actual Growth Rate

The actual growth rate is the growth rate determined by the actual rate of savings and investment in the country.The actual growth rate (G) is determined by the saving-income ratio and capital-output ratio. Both factors have been taken as fixed in the given period. The relationship between the actual growth rate and its determinants was expressed as:

$$GC = s$$

Where,

G = Actual rate of growth (or $\Delta Y/Y$)

C = Capital output ratio[or $(I/\Delta Y)$]

s = Saving income ratio

This relation explains that the condition for achieving the steady-state growth is that ex-post savings must be equal to ex-post investment.

Warranted Growth

Warranted growth refers to the growth rate of the economy when it is working at full capacity. It is also known as full-capacity growth rate. This growth rate, denoted by G_w is interpreted as the rate of income growth required for full utilisation of a growing stock of capital, so that entrepreneurs would be satisfied with the amount of investment actually made.

Warranted growth rate (G_w) is determined by the capital-output ratio and saving-income ratio. The relationship between the warranted growth rate and its determinants can be expressed as:

$$G_w C_r = s$$

G_w = Warranted growth rate

C_r = Amount of capital required to maintain the warranted growth rate

s = Saving-income ratio

According to Harrod, the economy can achieve steady growth when

$$G = G_w \text{ and } C = C_r$$

This condition states, firstly, that the actual growth rate must be equal to the warranted growth rate. Secondly, the capital-output ratio needed to achieve G must be equal to the required capital-output ratio in order to maintain G_w, given the saving coefficient (s).

This amounts to saying that actual investment must be equal to the expected investment at the given saving rate.

Instability of Growth

Equality between G & Gw is rarely found because of economic and political pressure in the economy.

Two Possible Types of Instability

1. $G > G_w$ or $C < C_r$-----rate of growth of income > rate of growth of output. This leads to inflation.

2. $G < G_w$ or $C > C_r$----- rate of growth of income < rate of growth of output.

This leads to deflation.

So, the equality between G and G_w is the essential condition for steady-state growth. It is called 'Knife-edge equilibrium'. G & G_w are determined by a variety of economic and non-economic factors. A slight difference in variables may disturb the equilibrium. Knife-edge equilibrium is inherent in the Harrod model.When the actual growth rate (G) is less than the warranted growth rate (G_w), there is excess supply of goods but not enough demand to buy them, leading to deflation. This happens when capital requirements (C) exceed the actual capital used (C_r), resulting in underutilised capacity and insufficient income to clear the market. When there is more capital available than needed, its efficiency declines, leading to reduced investment. This causes long-term economic stagnation, chronic depression, and unemployment, a state known as secular stagnation. From the above analysis, it can be concluded that steady growth implies a balance between G and G_w. In a free-enterprise economy, it is difficult to strike a balance between G and G_w as the two are determined by altogether different sets of factors.

Natural Growth Rate

G_n the Natural growth rate is determined by natural conditions such as labour force, natural resources, capital equipment, technical knowledge, etc. These factors place a limit beyond which expansion of output is not feasible. This limit is called the Full-Employment Ceiling. This upper limit may change as the production factors grow, or as technological progress takes place. Thus, the natural growth rate is the maximum growth rate that an economy can achieve with its available natural resources.

2.2.2.3 The Domar Model

Domar's model explains the need for continuous investment to retain economic growth and avoid stagnation. The growth rate is determined by the savings rate and the productivity of capital.The main growth model of Domar bears a certain resemblance to the model of Harrod. In fact, Harrod regarded Domar's formulation as a rediscovery of his version after a gap of seven years. Domar's theory was just an extension of Keynes' General Theory.

Major Assumptions of the Model

a. **Constant Saving Rate Across All Income Levels**: This means that a constant fraction of national income is saved, irrespective of the level of income growth.

b. **Constant Capital-Output Ratio:** A fixed amount of capital investment is needed to produce a specific level of output, indicating a direct and constant relationship between capital and production.

c. **Full Employment:** The assumption of full employment means that there are no unemployed resources, including labor and capital.

d. **Absence of Lag:** There is no delays or lags in adjustments. Changes in investment immediately translate into changes in output and vice versa.

e. **Constant Level of Technology:** There is no technological advancement or innovation that could impact productivity or capital needs.

Domar's theory emphasises the dual role of investment ie., it generates income through the multiplier effect and increases productive capacity through the accelerator effect. The challenge is to determine the rate of investment growth that would balance the increase in income with the growth in productive capacity, thereby maintaining full employment. Domar achieves this balance by linking total supply and demand through investment, essentially seeking the equilibrium rate of investment growth.

Demand Side

$$\Delta Yd = \frac{\Delta I}{S}$$

The equation shows the multiplier effect of income increase.

Supply side

$$\Delta Yd = I\,\sigma$$

Equilibrium in the economy:

$$\frac{\Delta I}{S} = I\,\sigma$$

$$\frac{\Delta I}{I} = S\,\sigma$$

As shown in the last equation, the rate of investment growth, denoted by $\frac{\Delta I}{I}$, is the rate needed to achieve equilibrium. For the system to be stable, this rate must be equal to Sσ. The variable σ is defined as the reciprocal of the capital-output ratio.

$$\frac{\Delta I}{I} = S \times \frac{1}{Capital - Output\ ratio}$$

Analysis of Disequilibrium

Disequilibrium (non-steady state) prevails when the actual rate of investment growth, represented Δ I by I, is not equal to the equilibrium rate, Sσ. This can be expressed in two main ways:

- **Growth is too fast:** When $\frac{\Delta}{I} > s\sigma$, the rate of investment growth is greater than what is needed for equilibrium. This can lead to an economic boom.
- **Growth is too slow:** When $\frac{\Delta}{I} < s\sigma$, the rate of investment growth is less than the equilibrium rate, which can lead to a recession or economic slowdown.

The main points of the Harrod-Domar analysis are summarised below:

1. Investment is the central variable of stable growth, and it plays a double role; on the one hand, it generates income, and on the other, it creates productive capacity.

2. The increased capacity arising from investment can result in greater output or greater unemployment, depending on the behaviour of income.

3. Conditions concerning the behaviour of income can be expressed in terms of growth rates, i.e. G, G_w and G_n , and equality between the three growth rates can ensure full employment of labour and full utilisation of capital stock.

4. These conditions, however, specify only a steady-state growth. The actual growth rate may differ from the warranted growth rate. If the actual growth rate is greater than the warranted rate of growth, the economy will experience cumulative inflation. If the actual growth rate is less than the warranted growth rate, the economy will slide towards cumulative inflation.

5. Business cycles are viewed as deviations from the path of steady growth. These deviations cannot go on working indefinitely. These are constrained by upper and lower limits; the 'full employment ceiling' acts as an upper limit, and effective demand, composed of autonomous investment and consumption, acts as the lower limit. The actual growth rate fluctuates between these two limits.

Table 2.2.1 Comparison of Harrod and Domar models

Harrod Model	Domar Model
Investment=Saving	Change in Investment = change in Saving
Harrod used the accelerator principle	Domar used the investment multiplier
Harrod's equations are Behavioural equations	The Domar equation is a Technical equation
Induced investment	Planned investment
Incremental capital output ratio	Reciprocal of the Incremental capital output ratio
Three growth rates	One growth rate

2.2.2.4 Criticisms of the Harrod-Domar Model

The Harrod-Domar model, though pioneering in linking savings and investment to economic growth, has been subject to several criticisms due to its theoretical limitations and practical shortcomings. These criticisms are outlined below:

1. **Fixed Capital-Output Ratio:** The model assumes a constant capital-output ratio, implying no flexibility in production techniques. This means capital and labour cannot be substituted for one another, which is unrealistic, as in real economies, firms can adjust inputs based on changing economic conditions.

2. **Absence of Technological Progress:** Technological advancement, a key driver of long-run economic growth, is not explicitly included in the model. As a result, the model underestimates the role of innovation and productivity improvements.

3. **Growth Instability:** The model predicts that unless the actual growth rate exactly equals the warranted growth rate, the economy will move further away from equilibrium, leading to either inflationary pressures or unemployment. There is no built-in mechanism for self-correction.

4. **Neglect of Labour Market:** The model largely ignores labour as a constraint, assuming that capital accumulation alone determines output growth. It does not consider how changes in labour supply, employment, or wages affect the growth process.

5. **Overemphasis on Savings and Investment:** By focusing solely on the savings rate and capital efficiency, the model overlooks other important determinants of growth, such as consumption patterns, government policy, trade, and external shocks.

6. **No Role for Factor Prices:** Wages, interest rates, and prices do not influence the model's outcomes. This makes the model unsuitable for analysing economies where price mechanisms and market adjustments play significant roles.

7. **Unrealistic Assumptions:** The assumption of full employment of capital, linear production, and the absence of diminishing returns makes the model overly simplistic and less applicable to real-world economies.

8. **Limited Use for Developed Economies:** The model is better suited for underdeveloped or capital-scarce economies. In advanced economies where capital is abundant, the focus on savings and investment alone cannot explain growth.

Recap

- The Harrod-Domar growth model was developed separately by two economists
- Harrod Model and the Domar Model brought out the importance of saving and investment in the process of economic growth
- Harrod-Domar models analysed the requirements of steady growth
- The non-fulfilment of the equilibrium conditions would lead to disequilibrium, resulting in an inflationary and deflationary gap
- Although the two models differ in detail, they are similar in substance. Therefore, they are often integrated and collectively referred to as the Harrod–Domar Model of Growth

- The Harrod-Dmar model was developed in the context of advanced market economies. But it has been widely used in formulating plan models in developing economies
- The Harrod-Domar assumes fixed ratios and ignores technology and labour, making it unstable and unrealistic
- The Harrod-Domar model focuses too much on savings and does not fit developed economies where growth depends on innovation

Objective Questions

1. Who are the economists behind the Harrod-Domar Model?
2. What are the two key determinants of growth in the Harrod-Domar Model?
3. What does the capital-output ratio indicate?
4. What is the main focus of the Harrod-Domar Model?
5. What is the basic formula used in the Harrod-Domar Model to calculate growth?
6. Which major economic factor is missing from the model's assumptions?
7. What happens in the model if actual growth is not equal to warranted growth?
8. Which factor is overemphasised in the model as the driver of growth?
9. Which labour-related aspect is neglected in the Harrod-Domar Model?
10. Which modern growth model improved on the Harrod-Domar assumptions?

Answers

1. Roy Harrod and Evsey Domar
2. Savings rate and capital-output ratio
3. It shows how much capital is needed to produce one unit of output
4. Investment-led economic growth

5. Growth = Savings rate / Capital-output ratio
6. Technological progress
7. Instability or divergence from steady growth
8. Savings and investment
9. Employment and labour supply
10. Solow-Swan Model

Assignments

1. State in brief the basic formulations of the Harrod model of growth?
2. Discuss the principal features of the Domar Model of growth?
3. State the conditions necessary for steady growth.
4. State the similarities and differences between the Harrod Model and the Domar Model.
5. What are the basic features of the Harrod-Domar Model of growth? Also state the limitations of this model.

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UNIT 3

Neo-Classical and Endogenous Growth Models

Learning Outcomes

After completing this unit, the learner will be able to:

- comprehend the concept of a steady state in the Solow-Swan model
- discuss the assumptions and features of endogenous growth theories
- discuss the policy implications of endogenous growth theories
- describe the challenges and limitations of both neo-classical and endogenous growth models

Prerequisites

The Solow Growth Model and Endogenous Growth Models provide a comprehensive framework for understanding economic growth. The Solow Model, a neoclassical approach, emphasises the role of capital accumulation, technological progress, and labour in driving growth, assuming diminishing returns to capital and exogenous technological progress. In contrast, Endogenous Growth Models, developed by economists like Paul Romer and Robert Lucas, internalise technological progress and knowledge accumulation, highlighting the importance of human capital, innovation, and knowledge spillovers in sustaining long-term growth. These models demonstrate how policy measures, institutions, and investments in education, R&D, and infrastructure can shape a country's growth trajectory, offering a more nuanced understanding of economic development and the potential for sustained growth through internal factors.

Keywords

Capital Accumulation, Technological Progress, Steady-state Equilibrium, Convergence Hypothesis, Innovation, Research and Development (R&D), Technology Adoption, Intellectual Property Rights, Learning by Doing

Discussion

2.3.1 Solow Growth Model

The Solow growth model, developed by Robert Solow in the 1950s, is a foundational framework in economics that explores the drivers of long-term economic growth and development. According to this model, saving and investment play a crucial role in economic growth, as they lead to an increase in the capital stock, which in turn raises the full-employment national income and product.The Solow model's core revolves around three key factors that explain economic growth as follows

1. **Capital Accumulation:** The model highlights the importance of capital accumulation, which occurs through saving and investment. As the capital stock increases, it contributes to economic growth.

2. **Technological Progress:** Technological advancements play a significant role in driving economic growth. Improvements in technology enhance productivity, leading to increased output and income.

3. **Population Growth:** The model also considers the impact of population growth on the economy. A growing population can lead to an increase in the labour force, which can contribute to economic growth.

2.3.1.1 Steady State

One of the significant contributions of the Solow model is the concept of a steady state, where an economy reaches an equilibrium point in output per capita over time. In this state, the economy grows at a stable rate, and the capital stock and output per capita reach a balanced growth path. The model is explained in the following diagram;

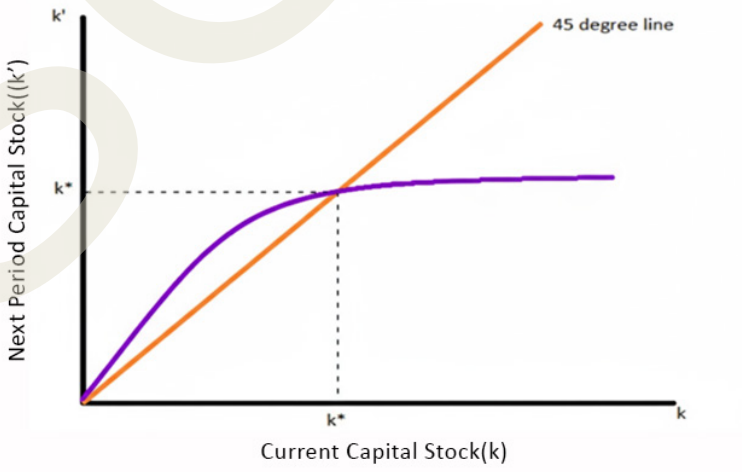

Fig. 2.3.1 Steady State Growth

The Solow growth model's diagram illustrates the dynamics of capital accumulation per effective worker. The X-axis represents the current capital stock per effective worker

(k), while the Y-axis represents the capital stock per effective worker in the next period (k'). The 45-degree line (orange) serves as a reference, indicating steady states where k' = k, meaning the capital stock per effective worker remains unchanged. The blue curve represents the relationship between current capital and next period's capital, influenced by factors like saving rate (s), depreciation rate (d), and growth rate of the effective labor force (g).

The steady-state equilibrium (k*) occurs where the blue curve intersects the 45-degree line. At this point, new investment and remaining capital exactly offset depreciation and the capital needed for new effective workers. Below k*, investment exceeds what is needed to maintain the capital stock, causing it to increase towards k*. Above k*, investment is insufficient, leading to a decrease in capital stock towards k*. This dynamic illustrates how the economy converges to a steady state, where capital per effective worker remains stable, and growth is driven by technological progress and population growth.

2.3.1.2 Solving the Solow Growth Model

1. In our analysis, we assume that the production function takes the following form

$$\mathbf{Y = aK^bL^{1-b}}, \qquad \text{where } \mathbf{0 < b < 1}$$

The production function is known as the Cobb-Douglas Production function, which is the most widely used neoclassical production function. Together with the assumption that firms are competitive, i.e., they are price-taking firms, the coefficient b is the capital share (the share of income that capital receives).

2. Therefore, output per worker is given through the following equation

$y = \mathbf{aK^b}$ where, y = Y/L (output per worker and k = K/L (capital stock per worker)

3. Under the assumption of competitive equilibrium, we get the following

The income-expenditure identity holds as an equilibrium condition: Y = C + I

Consumer's budget constraint: Y = C + S

Therefore, in equilibrium: I = S = sY.

4. The capital accumulation equation becomes: K' = (1–d)K + sY

K = capital the economy already have

(1−d)K = part of that capital which does not wear out

sY = new machines and buildings we add (investment)

K′ = total capital in the next period

5. The solution concept used is that of a steady state

6. The steady state is found by : k' = k

2.3.1.3 Implications of the Solow Growth Model

There is no growth in the long term. If countries have the same g (population growth rate), s (savings rate), and d (capital depreciation rate), then they have the same steady state, so they will converge, i.e., the Solow Growth Model predicts conditional convergence. Along this convergence path, a poorer country grows faster.Countries with different saving rates have different steady states, and they will not converge, i.e. the Solow Growth Model does not predict absolute convergence. When saving rates are different, growth is not always higher in a country with a lower initial capital stock.

2.3.1.4 Merits of the Model

The merits of Prof. Solow's model are under-mentioned are given below:

i. Solow retains the main features of the Harrod-Domar model like homogeneous capital, a proportional saving function and a given growth rate in the labour force.

ii. By introducing the possibility of substitution between labour and capital, he gives the growth process and adjustability and gives a more realistic touch.

iii. He considers a continuous production function in analysing the process of growth.

iv. Prof. Solow demonstrates the steady-state growth paths.

v. He successfully shunted aside all the difficulties and rigidities of modern Keynesian income analysis.

vi. The long-run rate of growth is determined by an expanding labour force and technical process.

2.3.1.5 Shortcomings of the Model

1. No Study of the Problem of Balance between G and G_w: Solow's model focuses on balancing warranted growth (G_w) with natural growth (G_n), but does not address the balance between actual growth (G) and warranted growth (G_w).

2. Absence of Investment Function:There is an absence of an investment function in Solow's model, and once it is introduced, the problem of instability will immediately reappear in the model, as in the case of the Harrodian model of growth.

3. Flexibility of factor price may bring Certain Problems:Prof. Solow assumed the flexibility of factor prices, but it may bring certain difficulties in the path of steady growth.

4. Unrealistic Assumptions:Solow's model is based on the unrealistic assumption that capital is homogeneous and malleable. But capital goods are highly heterogeneous and may create the problem of aggregation. In short, it is not easy to arrive at the path of steady growth when there are a variety of capital goods in the market.

5. No Study of Technical Progress:This model has left the study of technological progress. He has merely treated it as an exogenous factor in the growth process. He neglects the problem of inducing technical progress through the process of learning, investment and capital accumulation.

6. Ignores the Composition of Capital Stock:Another defect of Prof. Solow's model is that it totally ignores the problem of the composition of capital stock and assumes capital as a homogeneous factor, which is unrealistic in the dynamic world of today.

2.3.2 Endogenous Growth Models and Evidence on the Determinants of Growth

1. Evolution from Exogenous to Endogenous Growth Theory

Endogenous Growth Theory, first developed in the 1980s by economists such as Paul Romer and Robert Lucas, challenges this view by arguing that technological progress and other productivity-enhancing activities are the outcomes of economic decisions and policy incentives. These models incorporate mechanisms where investments in human capital, Research and Development (R&D), and knowledge accumulation generate increasing returns, thereby sustaining long-term economic growth from within the system.

2. Core Concepts of Endogenous Growth Models

Endogenous growth models are built on several key ideas:

a. **Knowledge Spillovers and Innovation:** Paul Romer (1986, 1990) emphasised that ideas and knowledge are non-rival and partially excludable goods. Investments in R&D by firms create innovations that not only benefit the investor but also spill over to others in the economy, enhancing overall productivity. Since knowledge does not suffer from diminishing returns, sustained growth becomes possible.

b. **Human Capital Accumulation:** Robert Lucas (1988) highlighted human capital as a crucial engine of growth. He argued that education and learning-by-doing contribute to productivity improvements. Investment in human capital leads to a virtuous cycle of skill development, innovation, and income generation.

c. **Increasing Returns to Scale:** Endogenous growth models typically assume increasing returns to scale in production due to the accumulation of knowledge or human capital. This contrasts with the diminishing returns to capital in neoclassical models and explains why poor countries may fail to catch up with rich countries automatically.

d. **Policy Implications:** Since growth is driven by internal factors, government policies can play an active role in shaping growth trajectories. Subsidies for education and R&D, protection of intellectual property rights, and investments in infrastructure can all influence the long-run growth rate.

3. Key Endogenous Growth Models

Several important models have been developed under the endogenous growth framework:

Romer Model (1990): Focuses on technological change driven by profit-maximising firms engaging in R&D.

Lucas Model (1988): Emphasises the role of human capital accumulation and learning-by-doing.

AK Model: A simplified model where the production function is linear in capital: Y = AK. There is no diminishing return to capital, allowing sustained growth without technological progress.

Jones Model (1995): Introduces limits to knowledge growth to reconcile empirical observations with theory.

Each of these models provides a different mechanism for explaining how internal economic activities lead to sustained growth.

4. Empirical Evidence on Determinants of Growth

Empirical studies have sought to test the predictions of endogenous growth theory by identifying and evaluating key determinants of growth. Some prominent findings include:

a. **Human Capital:** Cross-country regressions (Barro, 1991; Mankiw, Romer& Weil, 1992) show a strong correlation between educational attainment and growth rates. Countries that invest more in primary, secondary, and tertiary education experience faster GDP growth. However, the quality of education also matters, not just years of schooling.

b. **Innovation and R&D:** Countries with higher R&D expenditure and greater numbers of patents tend to grow faster. Studies of OECD economies demonstrate that innovation-led industries drive productivity gains. For example, Coe and Helpman (1995) found that international R&D spillovers significantly enhance growth in both advanced and developing countries.

c. **Institutions and Governance:** Endogenous growth theory has been extended to include institutional factors. Good governance, protection of property rights, and rule of law are found to significantly affect investment and innovation, as shown in the work of Acemoglu, Johnson, and Robinson (2001).

d. **Openness and Trade:** Openness to international trade enhances growth by encouraging technology transfer, specialisation, and competition. Sachs and Warner (1995) provided evidence that open economies grow faster than closed ones.

e. **Infrastructure and Public Investment:** Public infrastructure - such as roads, electricity, and communication - supports private sector productivity and can enhance growth, especially in developing countries. The World Bank (2005)

highlights that infrastructure development is strongly linked to economic performance.

5. **Criticisms and Challenges:** While endogenous growth models offer more explanatory power than their predecessors, they are not without criticism:

Empirical Ambiguity: Identifying causality between variables such as education or R&D and growth is challenging due to endogeneity issues.

Over-Simplification: Some models (like the AK model) are overly simplistic and do not account for heterogeneity across countries.

Data Limitations: Measuring human capital, innovation, and knowledge accurately across countries remains difficult.

Neglect of Environmental Constraints: Many endogenous models overlook ecological sustainability, which is crucial for long-term growth.

Endogenous growth theory marks a significant advancement in economic thought by internalising the sources of technological change, human capital development, and knowledge spillovers. These models highlight the role of policy, institutions, and innovation in shaping a country's growth path. While empirical studies support many of these insights, challenges remain in measurement and model specification. Nevertheless, endogenous growth theory has had a lasting influence on both academic research and real-world policy, offering a more nuanced and optimistic view of how countries can achieve sustained development from within.

Recap

- Endogenous growth theory focuses on internal economic forces that drive growth
- Endogenous growth theory rejects the idea that technology is purely exogenous
- Human capital development is central to long-term economic expansion
- Paul Romer's model highlights the importance of knowledge and innovation
- Robert Lucas stressed learning-by-doing and human capital externalities
- The AK model assumes constant returns to capital, ensuring steady growth
- Investment in research, education, and technology leads to increasing returns

- Knowledge is non-rival and creates positive spillover effects
- Institutional quality and governance are critical growth determinants
- Empirical studies show that open economies grow faster than closed ones
- Endogenous models explain persistent income differences among countries
- Policies that promote education, innovation, and institutional reform support sustained growth

Objective Questions

1. Who introduced the concept of endogenous growth through innovation and knowledge in 1986?
2. Which economist emphasised the role of learning-by-doing in growth?
3. What is the name of the model that assumes constant returns to capital?
4. What type of good is knowledge considered in endogenous growth models?
5. Which factor is central to economic growth in Robert Lucas's model?
6. Which type of returns does investment in R&D lead to in endogenous growth theory?
7. What internal economic factor rejects the idea of externally given technology?
8. Name one key institutional factor that supports economic growth.
9. Which economies, open or closed, tend to grow faster according to empirical studies?
10. What type of policy focus is suggested by endogenous growth models for sustained growth?

Answers

1. Paul Romer
2. Robert Lucas
3. AK Model
4. Non-rival good
5. Human capital
6. Increasing returns
7. Endogenous technological change
8. Good governance
9. Open economies
10. Investment in education, innovation, and institutions.

Assignments

1. Discuss the core assumptions and features of endogenous growth models. How do they differ from classical and neoclassical growth theories?

2. Explain the role of human capital and innovation in sustaining long-term economic growth according to endogenous growth theories.

3. Critically evaluate the AK model and its implications for continuous economic growth.

4. Analyse the importance of institutions and governance in influencing growth, with reference to empirical evidence.

5. Examine how openness to trade and R&D spill-overs act as key determinants of economic growth in the context of endogenous growth models.

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Approaches to Development

UNIT

Underdevelopment and the Development Gap

Learning Outcomes

After completing this unit, the learner will be able to:

- familiarise themselves with the characteristics of underdevelopment
- know the reasons for underdevelopment
- comprehend the concept of the development gap
- get an insight into the major issues in an underdeveloped economy

Prerequisites

The study of economic development helps us to understand the nature and causes of poverty in low-income countries, and the transformation of societies from being primarily rural to being primarily industrial, with the vast bulk of resources utilised in industrial activities and in service activities which serve the industrial sector. But why have some countries never participated in this process or been left behind? The First Industrial Revolution gave the present developed countries an initial advantage, which they sustained through various cumulative forces that worked against those left behind. Over the past forty years, a Second Industrial Revolution has propelled another group of countries, commonly referred to as the newly industrialised countries of Southeast Asia and Latin America, into a virtually industrialised state, while moving many others into a semi-industrialised state. However, many countries remain in a semi-feudal state, including the very poorest, which have now become the primary focus of concern for the World Bank and other development agencies.

This unit shall provide information regarding the underdeveloped economies and their features. It provides a basis for the understanding of the reasons for underdevelopment and the development gap. The study of underdeveloped

economies shall provide clear information regarding the causes, challenges and prospects of an underdeveloped country. This unit also provides a basis for the concept of under development.

Keywords

Under Development, Development Gap, Per Capita Income, Poverty, Inequality, Capital Formation, Unemployment, Population Growth

Discussion

3.1.1 Characteristics of Underdevelopment

Have you heard about countries like Niger, the Central African Republic, Chad, Burundi, South Sudan, Mali, Burkina Faso, and Sierra Leone? These are the top 10 most underdeveloped countries in the World according to the United Nations HDI 2020. World Development Report categorises economies on the basis of income in three categories, viz. high income, middle income and low income economies. Usually, high-income countries are known as developed / advanced economies while low-income countries are known as underdeveloped economies. Developed or advanced economies are also characterised by a high standard of living, universal and quality education, better health care facilities and a high life expectancy. The underdeveloped economy is one which has low per capita income, a high rate of population growth, dependence on backward agriculture, etc., as compared to a developed economy. According to Prof. Samuelson, "Every country is an underdeveloped country, because a country never achieves perfection of development, there is always scope for further development."

Underdevelopment is a low level of development characterised by low real per capita income, widespread poverty, lower level of literacy, low life expectancy and underutilisation of resources, etc. The state in an underdeveloped economy fails to provide acceptable levels of living to a large fraction of its population, thus resulting in misery and material deprivations. We need to note here that underdevelopment is a relative concept, but it sustains absolute poverty.

Absolute poverty refers to the state of poverty wherein the people fail to fulfil even their basic needs in terms of food, clothing and shelter. In fact, they are a class of people who are always striving to survive. Thus, underdevelopment and absolute poverty go together, or underdevelopment sustains absolute poverty. Some of the common characteristics displayed by most of the underdeveloped countries in the world are as follows:

- **Low Per Capita Income:** Almost all underdeveloped countries of the world show low per capita income in comparison to developed countries of the world.

- **Slow Growth Rate of Per Capita Income:** Low per capita income and slow growth rate of per capita income are characteristics of these countries.

- **Economic Inequalities:** High inequality of income and wealth is another common feature of underdeveloped countries. In these countries, a large percentage of national income is shared by a small segment of society, while a large segment of society gets barely enough to survive. Economic inequality exists even in developed countries, but it is not as much as found in underdeveloped countries.

- **Low Level of Living:** The Level of living in the underdeveloped countries is low because of low per capita income. The low level of living of the people of underdeveloped countries is also reflected in the Human Development Index prepared by the United Nations Development Programme (UNDP). HDI of developed countries is very high, whereas for underdeveloped countries it is very low.

- **Low Rate of Capital Formation:** The rate of capital formation is very low in underdeveloped economies due to low income levels and a high incidence of poverty.

- **Backward Techniques of Production:** Underdeveloped economies use outdated technology for production. Lack of capital leads to less spending on research and development.

- **Low Productivity of Labour:** Underdeveloped economies are characterised by low labour productivity due to a low level of skill set.

- **Underutilisation of Natural Resources:** Natural resources are underutilised in underdeveloped economies. Their capability to exploit them is very low.

- **Infrastructural Backwardness:** Economic infrastructure and social infrastructure are almost at their bottom level in underdeveloped countries.

- **Low Volume of Foreign Trade:** Underdeveloped countries export primary products like agricultural goods, minerals, petroleum oil, etc., and import finished products, especially consumer goods. Terms of trade are grossly unfavourable to underdeveloped countries.

Predominance of Agriculture: A Large section of people in underdeveloped economies depends on the primary sector for employment. But the primary sector is not well-developed in those countries. In India, agriculture and allied sectors contribute nearly 14.2 per cent of Gross Domestic Product (GDP) according to the 2010-11 estimates released by the Central Statistics Office (CSO). Moreover, in India, agriculture provides employment to around 50 per cent of the workforce. The share of income in agriculture is, however, considerably less than the share of employment in agriculture, which clearly reflects the relatively low productivity per labour unit in the agricultural sector.

Rapid Population Growth Rate and High Dependency Ratio: A high population growth rate is also an indicator of underdevelopment. India's population growth rate

was 1.93% per annum and 21.34 % per decade during 1991-2001, which is still very high as compared to developed economies. Dependency ratio refers to the ratio of the dependent population (non-working) to the total population. In India dependency ratio is around 60% which is very high. This is because of the high birth rate and social circumstances.

High Incidence of Poverty: Low per capita income results in a high incidence of poverty in underdeveloped economies. According to the United Nations Development Program's (UNDP) Global Human Development Index 2023, India ranked 130th among 193 countries.The report highlighted that 415 million Indians were lifted out of multidimensional poverty between 2005-06 and 2019-2021. As per World Bank estimates, extreme poverty fell to 5.3% of the population (around 75 million people) in 2022-23, a steep decline from over 344 million in 2011-12, reflecting that more than 125 million people exited poverty. The Planning Commission released the second India Human Development Report (HDR) 2011. The report claims that poverty, unemployment and child labour are declining. According to this report, the absolute number of the poor (27 per cent) stood at 302 million as compared to 320 million in 1973. Poverty is widespread in the underdeveloped countries, liven though major progress has been registered over the past 25 years, the absolute number of poor has in fact increased.

Unemployment and Underemployment: Unemployment is a phenomenon of all economies, whether developed or underdeveloped. But the nature and degree of unemployment are different in developed and underdeveloped economies.

In developed economies, most of the unemployment is cyclical, which arises because of fluctuations in business cycles. In underdeveloped economies like India, chronic unemployment is found, which results from the structural defects in the economy.

Moreover, underemployment is widespread in underdeveloped countries. Underemployment is a condition in which a person is getting work but not according to his/her capacity and qualifications.

Low Level of Human Development: The Human Development Index (HDI) constructed by the United Nations Development Programme (UNDP) has become an important indicator of development. HDI is a composite index of three important parameters of development; education, health and income. Every year, in the Human Development Report (HDR) value of HDI is calculated for each country, and then they are ranked and classified into three categories: high, medium and low human development countries. According to the UNDP Global Human Development Index (HDI) 2011. India is ranked 134th among 187 countries. A low level of human development is an important feature of an underdeveloped economy.

Social Peculiarities: High illiteracy rate, male-dominated society, a joint family system, fatalism, lack of entrepreneurship, casteism, communalism, widespread child labour, etc., are some characteristics of underdeveloped economies which distinguish them from developed societies.

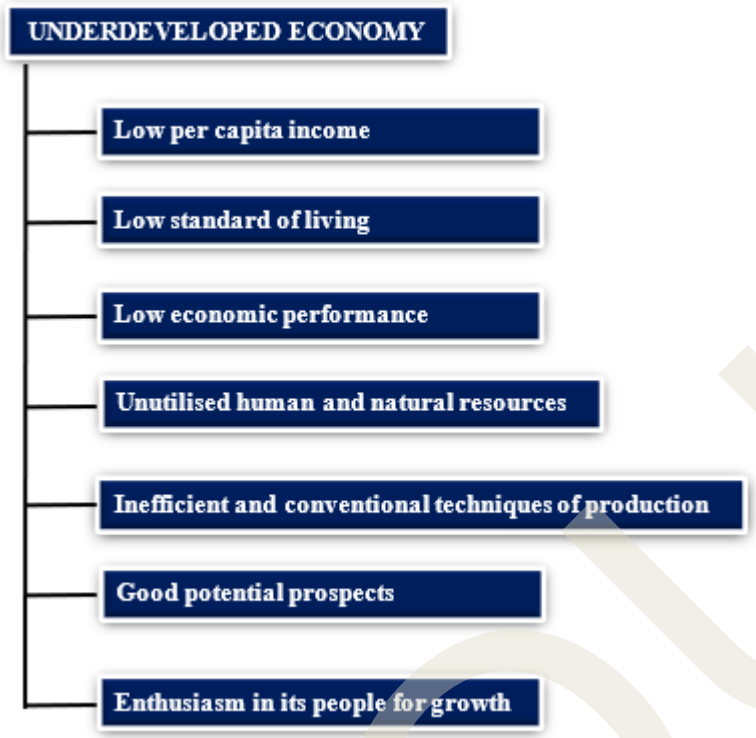

Figure 3.1.1 Features of Under Development

Reasons for Underdevelopment

The following are the important reason for underdevelopment;

- Low per capita income
- Economic inequalities
- Low levels of living
- Dependence on agriculture
- Low growth rate of per capita income
- High rate of population growth
- Features concerning foreign trade
- Vicious circle of poverty
- Unemployment and underemployment
- Deficiency of capital
- Backward techniques of production
- Backward industrial structure

3.1.2 Development Gap

Development means positive change that makes things better. It usually means that people's standard of living and quality of life will improve. The Development gap is the difference in standard of living between the world's richest and poorest countries. The development gap refers to the widening gap between the richest (most developed) and poorest (least developed) countries of the world. Development in this sense can be referred to as either economic development, where the county has an increase in wealth, or human development, where quality of life is improved for the people who live there.

The statement that 'the rich countries get richer and the poor countries get poorer' has become a popular cliche in the literature on world poverty, but without so much discussion of the facts or the precise magnitude of the development task facing the developing countries if the per capita income gap between rich and poor nations is to be narrowed.

Causes of Uneven Development

1. **Physical:** Landlocked countries are cut off from seaborne trade, which is important for economic growth, e.g. Chad. Lack of adequate supplies of clean water can affect farming and the health of workers. Extreme weather, e.g. droughts, can slow the development, and it can be costly to repair infrastructure. Climate-related diseases and pests affect the ability of the population to stay healthy enough to work, e.g. malaria.

2. **Economic-Trade:** Low-income countries often trade raw materials, and high-income countries want to pay as little as possible for these. As there is a large supply of raw materials, the price remains low. High Income Countries process these materials, adding value to them, and so the rich get richer while the poor get poorer. Raw material value can fluctuate, making it unreliable.

3. **Historical - Colonialism:** Almost all wealth produced in the colonial period went to European powers. Countries have since become independent, but this is a difficult process resulting in civil wars and political struggles for power, which have continued to hold back development.

Impacts of Uneven Development

1. **Imbalance between Rich and Poor**: Some countries have lower levels of development and poorer quality of life than others. Imbalances also exist within countries.

2. **Disparities in Wealth:** In 2014, the fastest growth of wealth was in North America, which holds 35% of global wealth. Africa's share of global wealth is about 1%.

3. **Disparities in Health**: In low-income countries, complications during childbirth and infectious diseases like HIV and malaria are major causes of death, while in high-income countries, chronic illnesses such as cancer are the leading causes of death.

Recap

- Underdevelopment characterised by low real per capita income, widespread poverty, lower level of literacy, low life expectancy and underutilisation of resources
- The development gap refers to the widening gap between the richest and poorest
- Economic development is economic growth leading to an improvement in the economic welfare. The rate of capital formation is very low in underdeveloped economies due to low income levels and a high incidence of poverty
- According to Prof.Samuelson, "Every country is an underdeveloped country, because a country never achieves perfection of development. There is always scope for further development"
- Low per capita income, economic inequalities, low levels of living, dependence on agriculture, and low growth rate of per capita income are some of the reasons for underdevelopment
- The concept of underdevelopment is a relative one.
- Absolute poverty refers to the state of poverty wherein the people fail to fulfil even their basic needs in terms of food, clothing and shelter
- High inequality of income and wealth is another common feature of underdeveloped countries
- A large section of people in underdeveloped economies depends on the primary sector for employment
- The primary sector is not well-developed in LDCs

Objective Questions

1. "Underdeveloped countries are the slums of the world Economy." Who has given this statement?
2. State any one of the characteristics of underdevelopment?
3. Most of the underdeveloped economies suffer from a pressure which do not let the rate of growth go up from a lower level-what is that?

4. Scarcity of capital, unemployment and technological backwardness are generally found in which type of economies?

5. What does Economic development refer to?

6. An underdeveloped economy is characterised by which factor?

7. Capital formation in underdeveloped countries is a major bottleneck. What is the reason?

8. What term refers to the widening gap between the richest (most developed) and poorest (least developed) countries of the world?

9. Large sections of people in underdeveloped economies depend on which sector for employment?

10. Which type of poverty refers to the state of poverty wherein the people fail to fulfil even their basic needs in terms of food, clothing and shelter?

Answers

1. A.N. Caimcross
2. Vicious circle of poverty
3. High population pressures
4. Underdeveloped
5. State of deprivation of a large proportion of the population
6. Mass poverty
7. Low level of income
8. Development gap
9. Primary sector
10. Absolute poverty

Assignments

1. Discuss the criterion for classifying economies as developed and underdeveloped.
2. Explain the meaning and definition of underdevelopment.
3. What are the characteristics of underdeveloped economies?
4. Differentiate between developed and underdeveloped economies.
5. Discuss the topic -India as a developing economy.

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UNIT 2

Poverty and Inequality Measures

Learning Outcomes

After completing this unit, the learner will be able to:

- know the relation between economic growth, poverty, and inequality
- discuss the causes of poverty
- describe various measures of poverty and inequality

Prerequisites

Within the Sustainable Development Goals (SDGs), the eradication of extreme poverty remains a central objective of international development efforts. As with the Millennium Development Goals before them, the SDGs recognise that poverty has multiple dimensions and that progress is needed on a number of fronts (economic, social and political) if poverty is to be effectively tackled. Government departments, international development agencies and non-governmental organisations (NGOs) are thus expected to design policies and to plan interventions with a clear understanding of how these will contribute to poverty reduction objectives in the areas concerned.

Poverty remains one of the most critical challenges facing the world today, particularly in developing countries. It affects not only individual well-being but also national progress and global development. Understanding poverty; its nature, causes, and consequences, is essential for anyone involved in social science, development studies, economics, or public policy.

Over the past few decades, growing inequality has become a central concern in both developing and developed countries. High levels of inequality can limit social mobility, weaken economic growth, and lead to political instability. Inequality is not limited to income alone; it also includes disparities in education, health, access

to services, employment, and wealth. Understanding these dimensions requires the use of specific quantitative tools and indicators, such as the Gini coefficient, Lorenz curve, Palma ratio, and Theil index. These tools help policymakers and researchers identify the extent and nature of inequality and design appropriate policies to address it.

Keywords

Headcount Ratio, Poverty Gap Ratio, Squared Poverty Gap Ratio, Poverty Line, Gini Coefficient, Lorenz Curve- Kuznet Inverted U Shaped Curve, Economic Inequality, Income Inequality, Population Principle, Dalton Principle.

Discussion

3.2.1 Poverty

Poverty is a serious and complicated problem that affects people, families, and countries. It means not having enough basic things needed to live a decent life, like food, clothes, a place to live, education, and healthcare. It can be seen as a lack of money and property (like income or land), or a lack of abilities (like education, skills, or access to technology), or sometimes both. To reduce poverty and help people live better lives, it is important to understand what causes poverty and how it can be solved through good plans and policies.

3.2.1.1 Definitions of Poverty

World Bank Defenition

"Poverty is pronounced deprivation in well-being, and comprises many dimensions. It includes low incomes and the inability to acquire the basic goods and services necessary for survival with dignity."

UN Defenition

"Poverty is a denial of choices and opportunities, a violation of human dignity. It means a lack of basic capacity to participate effectively in society."

Amartya Sen's Capability Approach

Poverty should not be seen merely as a lack of income, but as a lack of capabilities to lead the life one values. The theory emphasises freedom, opportunities, and functionings. A person is poor if they are deprived of basic capabilities like education, health, and participation in community life.

3.2.1.2 Classifications of Poverty

There are two main classifications of poverty: relative poverty and absolute poverty.

Relative Poverty: Relative poverty exists when a person is poor compared with others in their society. Most poverty in developed countries tends to be relative poverty. It is measured in comparison with other people in the country and will vary between countries. Relative poverty is the condition in which people lack the minimum amount of income needed in order to maintain the average standard of living in the society in which they live. People are considered to be in relative poverty if they are living below a certain income threshold in a particular country. For example, in the EU, people falling below 60% of median income are said to be at risk of poverty and are said to be relatively poor. People are said to be impoverished if they cannot keep up with the standard of living as determined by society. Relative poverty also changes over time. As the wealth of a society increases, so does the amount of income and resources that the society deems necessary for proper living conditions. Relative poverty is useful for showing the percentage of the population who have been relatively left behind.

Absolute Poverty: It is a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information. It depends not only on income but also on access to basic human needs. Absolute poverty refers to when a person or household does not have the minimum amount of income needed to meet the minimum living requirements over an extended period of time. In other words, they cannot meet their basic needs. When an individual goes below this threshold, their survival is threatened.

3.2.1.3 Criteria for Poverty Measure

A desirable measure of poverty has four criteria. They are: anonymity, population and independence, monotonicity and distributional sensitivity. The first two principles are similar to the properties we explained for inequality indexes. The principles of anonymity and population independence mean that the measure of poverty should be irrespective of who the poor are and of what the size of the country's population is. The third principle, monotonicity, means that if you add income to someone below the poverty line, all other incomes held constant, poverty can be no higher than it was. The fourth criterion, distributional sensitivity, states that other things being equal, if you transfer income from a poor person to a richer person, the resulting economy will be poorer and vice versa.

3.2.2 Poverty Line

Suresh Tendulkar Committee defined the poverty line on the basis of monthly spending on food, education, health, electricity and transport. According to this estimate, a person who spends Rs. 27.2 in rural areas and Rs. 33.3 in urban areas a day are defined as living below the poverty line. The Rangarajan panel considered people living on less than Rs. 32 a day in rural areas and Rs. 47 a day in urban areas as poor.

The measurement of poverty is based on the notion of a poverty line. The poverty line is constructed from monetary estimates of minimum needs. The poverty line is

the amount of money needed for a person to meet their basic needs. It is defined as the money value of the goods and services needed to provide basic welfare to an individual.

3.2.3 Measures of Poverty

1. **The Headcount Ratio:** Absolute poverty may be measured by the number or 'head count' H of those whose incomes fall below the absolute poverty line Yp. The headcount ratio simply measures the proportion of the population below the poverty line. This ratio is found by counting people below the poverty line. It is often denoted by Pa.

Headcount Measure: The headcount is the simplest and best known poverty measure. It identifies the share of a population whose income is less than the poverty line. It is, not surprisingly, the most commonly calculated poverty measure. The measure literally counts heads, allowing policymakers and researchers to track the most immediate dimension of the human scale of poverty.

- The headcount is calculated by comparing the income of each household (yi) to the poverty line (z). (The index i = 1 to M, where M is the total number of households in the sample.)
- If the income is less than or equal to the poverty line, we assign it a value of 1 (meaning poor).
- If the income is greater than the poverty line, we assign it a value of 0 (not poor).

The headcount index is found by taking the average number of poor people in the sample. First, we count how many individuals live in households that are below the poverty line. This is done by adding up the number of people (ni) in each poor household. This total is called G, the number of poor individuals.

$$G = \sum_{i=1}^{M} ni.I\ (yi, z)$$

Where, i = 1 to M

We go through each household in the sample.

M is the total number of households, ni = Number of people in the i-th household, yi = Income of the i-th household.

z = Poverty line (minimum income to not be considered poor).

I (yi, z) is an indicator:

If household income yi ≤ z, then I(yi, z) = 1 (they are poor).

If household income yi > z, then I(yi, z) = 0 (they are not poor).

ni × I(yi, z):

If the household is poor, this gives the number of poor individuals in that household.

If not, it gives 0.

Sum all of these values across all households to get G, the total number of poor individuals.

Limitations

a. The main problem with Headcount ratio is that it fails to adequately account for the intensity of poverty.

b. The headcount index does not indicate how poor the poor are, and hence does not change if people below the poverty line become poorer.

c. The use of headcount can lead to problematic policy decisions. The use of head count as a measure of poverty systematically biases policy in favour of individuals who are very close to the poverty line.

2. Poverty Gap Ratio: The poverty gap measures the total amount of income required to bring the income of every poor person to the poverty line. Poverty gap has been explained by the following figure.

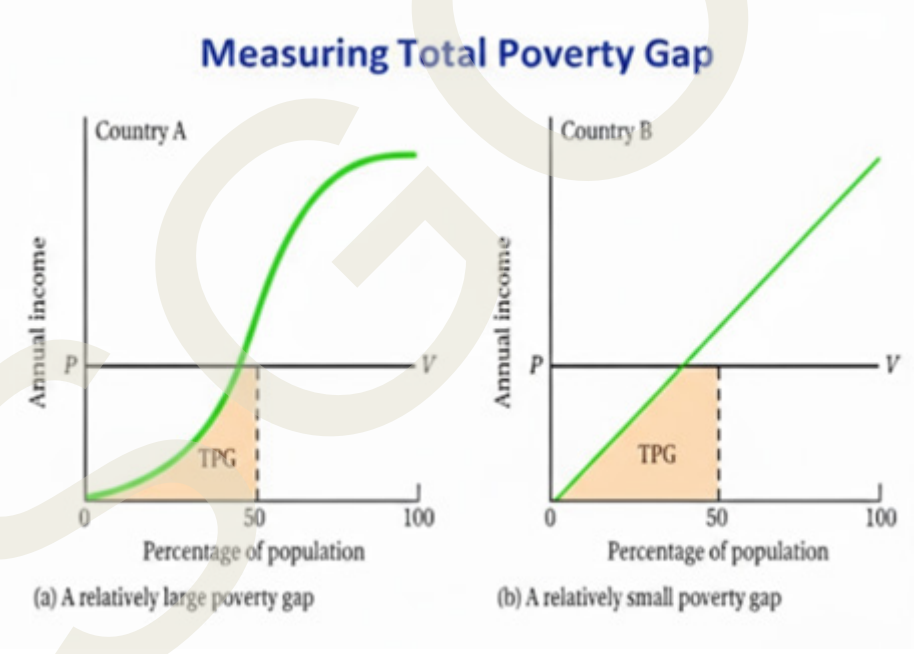

Fig 3.2.1 Poverty Gap

In the figure, the poverty gap is measured by the area between the poverty line, PV and the annual income profile (AIP) of the population.

In the figure, the X axis represents the cumulative percentage of the population, ranging from 0% to 100%. The population is typically ordered from the poorest to the

richest. Y axis represents the annual income of individuals or households. PV represents the Poverty Line. Any individual or household whose annual income falls below this line 'V' is considered to be living in poverty. Curved Line (or Straight Line in Country B) represents the Lorenz curve, or more specifically, a simplified representation of the cumulative distribution of income. It shows the cumulative percentage of total income received by the cumulative percentage of the population. Where this line intersects the poverty line 'V', it indicates the percentage of the population living below the poverty line (i.e., the headcount ratio). In both Country A and Country B, this intersection occurs at the 50% mark on the X-axis, meaning 50% of the population in both countries is living in poverty. The shaded blue area 'TPG' represents the Total Poverty Gap.

This second widely-used measure has a problem similar to the headcount: it is descriptively very useful but, if used alone, would also serve as a poor guide to resource allocation. The poverty gap measures the amount of money by which each individual falls below the poverty line. It matters here whether income and the poverty line are measured on a per capita basis or whether they have been put into adult equivalent terms or adjusted for scale economies.

3. Squared Poverty Gap (P_2)

The Squared Poverty Gap, also called the 'Poverty Severity Index,' is a measure that tells us how deep and severe poverty is. It is a more detailed way to understand poverty compared to just counting poor people or measuring their average income gap. It is also known as the Poverty Severity Index, which is another measure within the Foster-Greer-Thorbecke (FGT) family of poverty indices. It goes a step further than the Poverty Gap Index (P_1) by giving more weight to individuals who are further away from the poverty line.

3.2.4 Measures of Inequality

A highly skilled computer programmer in Western countries has seen their wages suppressed by competition from computer programmers in India who are willing to accept a lower wage. The final results of these supply and demand interactions are a gradation of different wages representing income inequality within society. The world's income is distributed extremely unequally between nations and people. There exists a broad north-south division into rich and poor countries in the world. There are two aspects to the measurement of income inequality across the world. The first is the inequality between nations, which may be termed international inequality. The other is the inequality between people across the world, which also takes into account the distribution of income within countries, which may be termed global inequality.

Two approaches are usually followed for measuring income inequality, both for analytical and quantitative purposes. The approaches are: (a) personal or size distribution of income and (b) functional distribution of income or distributive factor shares.

a. **Personal or Size Distribution of Income**: It gives a description of income flows to individuals or households, not factors of production. The way in which that income was received is not considered. What matters is how much each earns, irrespective of whether the income was derived solely

from employment or came also from other sources such as interest, profits, rents, gifts, or inheritance.

b. **Functional Distribution on Income or Distributive Factor Shares:** It attempts to explain the share of total national income that each of the factors of production (land, labour, and capital) receives. The theory of functional income distribution inquires into the percentage that labour receives in comparison to the percentage of total income received by the other three factors of production in the form of rent, interest, and profit.

Four Criteria for Inequality Measurement

Suppose that society consists of 'n' individuals. We use the index I to stand for a generic individual; thus, i = 1, 2, n. An income distribution is a description of how much income y is received by each individual 1: Y_1, Y_2.....Y_n). The following four criteria have been applied for measuring inequality.

1. **Anonymity Principle:** From an ethical point of view, it does not matter who is earning the income. This means that it is always possible to arrange income distribution such that this is the same as arranging individuals so that they are ranked from the poorest to the richest.

2. **Population Principle:** According to this principle, population size does not matter. All that matters is the proportions of the population that earn different levels of income. If we compare an income distribution with 'n' people and another population of 2n people with the same income pattern repeated twice, there should be no difference in inequality between the two income distributions.

3. **Relative Income Principle:** Only the relative income should matter, not the absolute levels of these incomes. This simply means that income levels have no relevance for the measurement of inequality. For example, an income distribution over two people of (500, 1000) has the same inequality as (2000, 4000), and regardless of the currency the incomes are denominated in.

4. **The Dalton Principle:** The Dalton principle states that if one income distribution is derived from another through a sequence of regressive transfers, that is, transfers of income from a poorer individual to a richer individual, then the resulting income distribution is more unequal than the original. In other words, any transfer that moves income from a person with lower income to one with higher income increases the overall inequality in the distribution.

Various measures of inequality are explained below:

1. **The Range:** It indicates the difference in the incomes of the richest and the poorest individuals, divided by the mean. So it is independent of the units in which income is measured. Thus, the range R is given by

   $R= (Ym-Y_1)$

   Obviously, this is a crude measure. It pays no attention to people between the richest and poorest on the same income scale. To be more specific, it fails to satisfy the Dalton principle, because, for example, a smaller transfer from the

second poorest to the second richest individual will keep the measure unchanged. However, range is used when detailed information on income distribution is not available.

2. **The Kuznets Ratios:** Simon Kuznets introduced these ratios in his pioneering study of income distributions in developed and developing countries. It refers to the ratio of the shares of income of the richest x% to the poorest y%, where x and y stand for numbers such as 10, 20 or 40. For example, the ratio of the income of the richest 10% to the income of the poorest 40% can tell us something about the distribution when more detailed information is not available. The Kuznets ratios are rough but nevertheless useful indicators of inequality when detailed data are not available.

3. **The Mean Absolute Deviation:** This is a measure which takes advantage of the entire income distribution. According to this measure, inequality is proportional to distance from the mean income. Therefore, simply take all income distances from the average income, add them up, and divide by total income to express the average deviation as a fraction of total income.

   Let us assume there are two people with incomes A and B, where A is less than the average income and B is more than the average income, so A < B. If a regressive transfer happens, taking from the poorer person A (below average income) and giving to the richer person B (above average income), then the inequality measure M increases because the gap between A and B widens. So far, the inequality measure is working as expected. Now, consider another case where both A and B have incomes above the population's mean income. If a regressive transfer happens from A to B, and both stay above the mean income after the transfer, the mean absolute deviation does not change. This is a problem because the Dalton principle says any regressive transfer should increase inequality, but mean absolute deviation doesnot always follow this principle when both incomes are above the mean, so it fails.

4. **The Coefficient of Variation:** The insensitivity of the mean absolute deviation can be avoided by giving more weight to larger deviations from the mean. A familiar statistical measure that does just this is the standard deviation, which squares all deviations from the mean. Because the square of a number rises more than proportionately to the number itself, this is effectively the same as attaching greater weight to larger deviations from the mean. The coefficient of variation is just the standard deviation divided by the mean; only incomes matter. The coefficient of variation can be expressed as;

$$CV = \frac{Standard\ Deviation}{Mean} \times 100$$

5. **Lorenz Curves:** Another common measure of income inequality is to construct the Lorenz curve. It is named after Conard Lorenz, an American statistician, who in 1905 devised the convenient and widely used diagram to explain the relationship between population groups and their income shares. Lorenz curves provide a pictorial representation of the degree of inequality in a society. It is explained below:

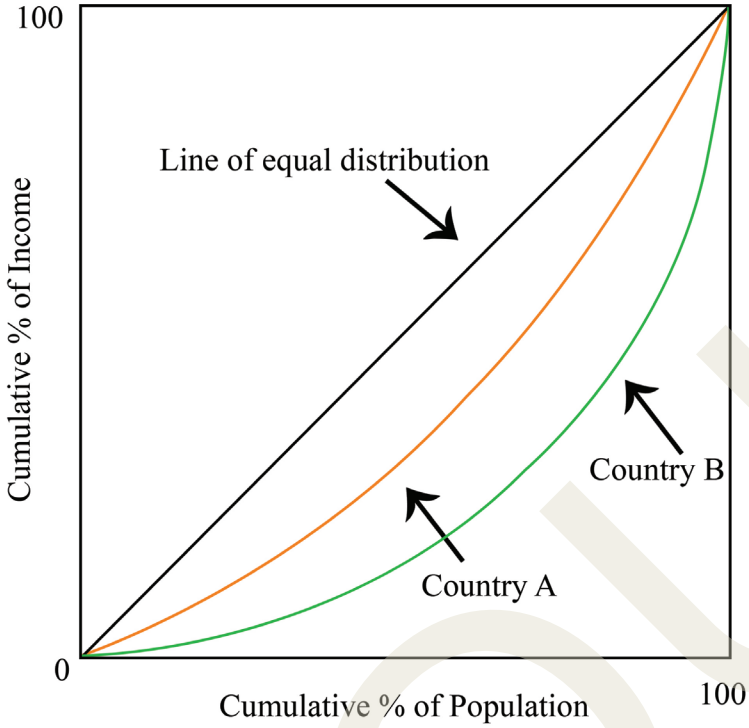

Fig 3.2.2 Lorenz Curve

In the diagram, the Y-axis displays the cumulative percentage of total income, while the X-axis represents the cumulative percentage of the population, ordered from the poorest to the richest. A perfectly equal distribution of income is depicted by a straight diagonal 'line of equality', formed by connecting the zero point to the point where both population and income reach 100%. When comparing two countries, such as Country A and Country B, the country whose Lorenz Curve bends further away from this line of equality exhibits greater income disparities; thus, if Country B's curve is more distant from the line of equal distribution than Country A's, it indicates that Country B has a higher degree of income inequality.

This measure satisfies all four principles for measuring inequality. So, Lorenz curves provide a clear, visual image of the overall distribution of income in a country. But if we want to summarise inequality by a number, rather than by a picture, other measures of inequality are to be used.

6. **The Gini Coefficient (or The Lorenz Ratio):** The Gini coefficient is a widely used measure that quantifies the relative degree of income inequality within a country. It was developed by the Italian statistician and sociologist Corrado Gini in the year 1921. The Gini coefficient is calculated by finding the area between the line of perfect income equality (the straight 45-degree diagonal line on a Lorenz curve graph) and the actual Lorenz curve (which shows the real distribution of income). This calculated area is then divided by the total area of the entire triangular region that sits below the line of perfect equality on the graph. (fig 3.2.3).

$$\text{Gini coefficient} = \frac{\textit{Shaded region}}{\textit{Area of the triangle BCD}}$$

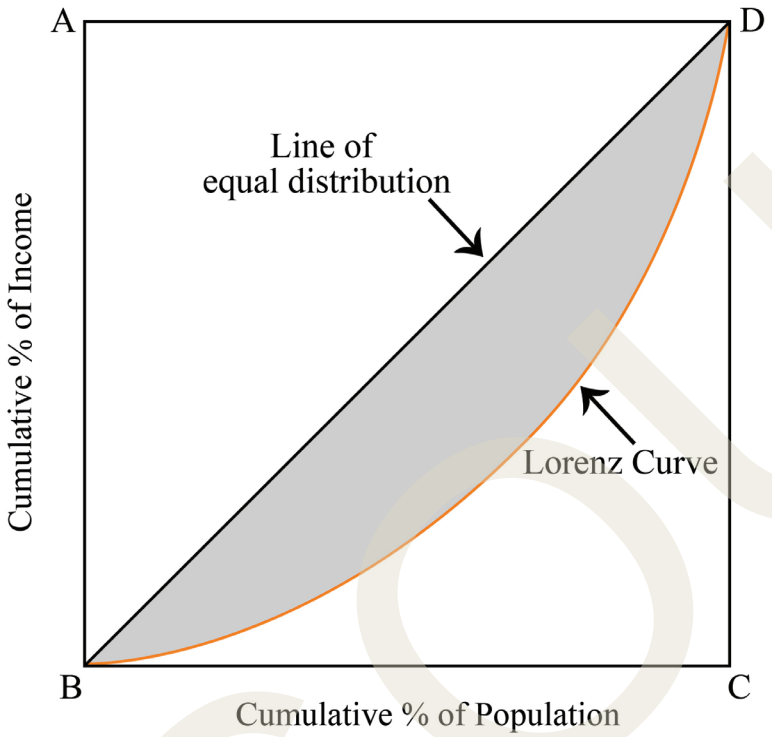

Fig 3.2.3 Gini Coefficient

The Gini coefficient is a key measure of overall income inequality, calculated as the ratio of the area between the Lorenz curve (representing actual income distribution) and the 45-degree line of perfect equality, to the total area of the triangle beneath the 45-degree line. This aggregate measure ranges from 0, signifying perfect equality where everyone has the same income, to 1, indicating perfect inequality where one person holds all the income. Generally, a Gini coefficient between 0.5 and 0.7 points to a highly unequal income distribution, whereas a range of 0.2 to 0.5 suggests a relatively equitable distribution across countries.

7. **Kuznets's Inverted U Hypothesis:** Simon Kuznets, an economist, suggested a specific link between how income is distributed and economic growth. He described how income inequality changes as an economy transforms from being mainly rural and agricultural to becoming industrialised and urban. According to him, this relationship forms an inverted U shape, which is now referred to as the Kuznets' curve. This is shown in the following figure:

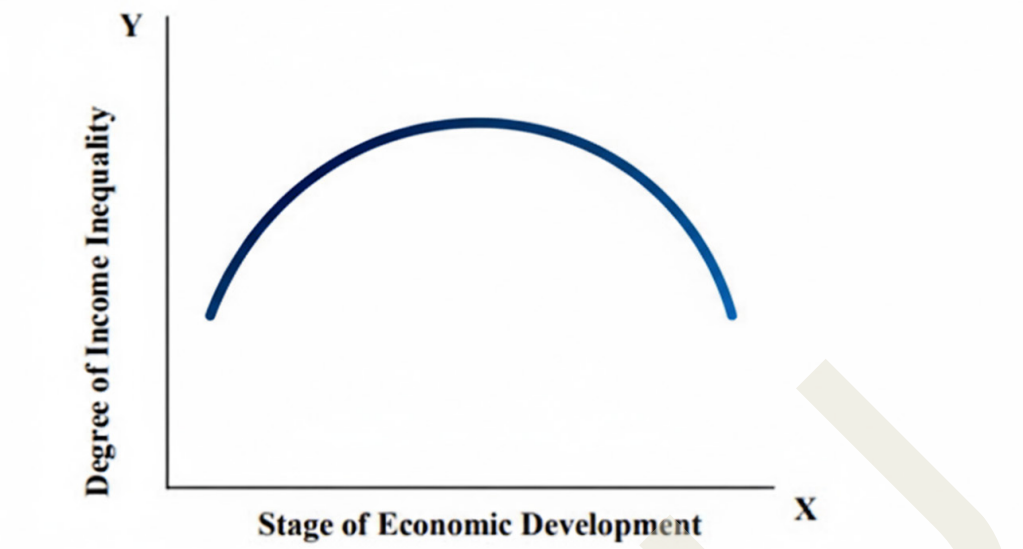

Figure 3.2.4 Kuznets's Inverted U Hypothesis

In the diagram, as economies start growing, we see that income inequality initially increases. Then, at a certain point, this inequality levels off and stays stable for a while. Eventually, in the later stages of economic growth, inequality starts to decrease.

Recap

- The poverty gap reflects the intensity of poverty in a nation
- It shows the average shortfall of the total population from the poverty line
- The poverty gap is an indicator produced by the World Bank
- It measures poverty by looking at per capita income and consumption in households
- The headcount ratio simply measures the proportion of the population below the poverty line
- The headcount ratio is found by counting people below the poverty line
- Poverty is generally considered to be a measure of deprivation of the basic needs that a person
- Deprivation can be measured either in terms of a lack of resources, capabilities or both
- Relative poverty exists when a person is poor compared with others in their society

- Most poverty in developed countries tends to be relative poverty
- Absolute poverty is "a condition characterised by severe deprivation of basic human needs, including food, safe drinking water, sanitation facilities, health, shelter, education and information
- The headcount is the simplest and best known poverty measure
- It identifies the share of a population whose income is less than the poverty line
- The Gini coefficient is a numerical measure of income or wealth inequality in a population, ranging from 0 - 1
- A higher Gini value indicates greater inequality
- The Lorenz curve is a graphical representation of income distribution
- The farther the Lorenz curve is from the line of equality, the greater the inequality
- The Gini coefficient is derived from the Lorenz Curve
- It is calculated as the ratio of the area between the line of equality and the Lorenz curve to the total area under the line of equality

Objective Questions

1. What is Poverty?
2. Which concept help absolute poverty determines the minimum physical quantities of the requirements for a subsistence level?
3. Which of the following countries has a greater prevalence of relative poverty?
4. Which of the following countries has a greater prevalence of absolute poverty?
5. Who propagated inverted U-hypothesis?
6. Which ratio simply measures the proportion of the population below the poverty line?

7. Which method measures the total amount of income required to bring the Income of every poor person to the poverty line?

8. Which concept is used to measure poverty usually?

Answers

1. Minimum
2. Poverty line
3. Capitalist countries
4. Developing countries
5. Simon Kuznet
6. Head count ratio
7. Poverty Gap
8. Poverty Line

Assignments

1. What are the various measures of poverty?
2. How is economic growth linked with poverty reduction in India?
3. Explain any five causes of poverty in India.
4. Describe various poverty alleviation programmes launched by the government to remove poverty in India.
5. What are the various measures of inequality?

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BLOCK

Development Vs Sustainable Development

UNIT

Theories of Growth and Development

Learning Outcomes

After completing this unit, the learner will be able to:

- comprehend the vicious circle of poverty
- explain Rostow's stages of growth
- compare balanced and unbalanced growth
- describe the Critical Minimum Effort and the Low Level Equilibrium Trap
- explain the concept of dualism in development

Prerequisites

Development theories aim to understand how societies change and grow over time, and they try to capture the key features of underdevelopment while explaining the development process. These theories and models seek to explain and predict how economies develop, identify barriers to growth, and find ways to overcome them. They also explore how governments can use policies to start, sustain, and accelerate growth. However, it is essential to note that development theories are generalisations, and each country's unique economic, social, cultural, and historical context means that the implications of a theory can vary significantly from one country to another. By studying these theories, we can gain a deeper understanding of the complex processes involved in economic development and develop a framework for monitoring and evaluating different approaches to development.

Keywords

Vicious Circle of Poverty, Stages of Growth, Balanced and Unbalanced Growth, Critical Minimum Effort, Low Level Equilibrium Trap, Dualism

Discussion

4.1.1 Vicious Circle of Poverty: Ragnar Nurkse

Nurkse explain the vicious circle from the angle of deficiency of capital. According to Nurkse, the vicious circle implies a circular constellation of forces tending to act and react upon one another in such a way as to keep a poor country in a state of poverty. Nurkse's proposition is that the basic feature of underdevelopment in underdeveloped countries is capital deficiency. People in less developed countries are poor because they have low income, which leads to low savings. Low savings result in low investment, causing low productivity. This keeps people in a state of poverty i,e.,

Low income → Low savings → Low investment → Low productivity → Persistent poverty

This is further worsened by poor education, inadequate health, and limited technological progress, making it difficult for underdeveloped countries to break free from the poverty trap and achieve development.From both the demand and supply sides, capital is deficient in UDCs.

4.1.1.1 Supply and Demand Side

The vicious circle operates from both the demand and supply side of capital formation. From the supply side, low income and the resultant low savings lead to a low level of capital. Shortage of capital inturn resulting in labour-intensive production methods. These methods are less productive, leading to low productivity and ultimately, low income.

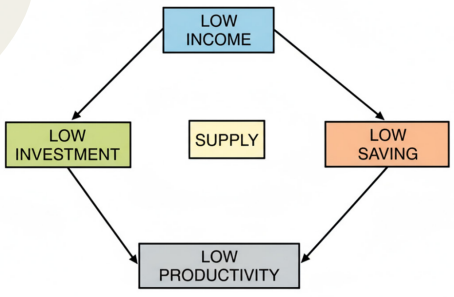

Fig. 4.1.1 Supply Side of Vicious Circle of Poverty

The diagram illustrates the vicious cycle of poverty, where low income leads to low savings and low investment. This lack of investment results in low productivity and a limited supply of goods and services, which ultimately keeps income low and perpetuates the cycle.

Demand Side of Vicious Circle

From the demand side, low income and low consumption result in a low size of the market. In an underdeveloped economy,low income leads to low purchasing power, resulting in limited market opportunities. This discourages investment, which in turn keeps income levels low. This cycle perpetuates underdevelopment, trapping the country in a low-income equilibrium due to insufficient demand and investment.

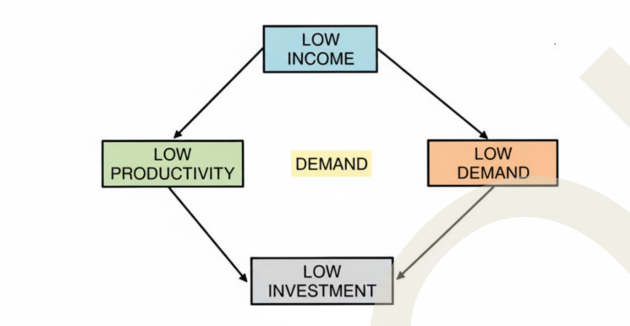

Fig. 4.1.2 Demand Side of Vicious Circle of Poverty

The diagram shows that low income directly causes low demand because people have less money to spend on goods and services. This lack of demand leads to low investment from businesses, which then results in low productivity, thereby causing low income again and restarting the cycle.

4.1.1.2 How to break the vicious circle?

Breaking the vicious circle of poverty requires a multi-faceted approach. One strategy is to implement balanced growth, where capital is applied synchronously to a diverse range of industries, promoting overall economic development. Active state participation and direct planning can also play a crucial role in guiding investment and resource allocation. Furthermore, increasing the rate of savings, potentially through compulsory savings measures, can help mobilise domestic resources for investment. Additionally, socio-cultural development is essential, as economic growth is closely tied to human endowments, social attitudes, and institutional factors. While capital is a necessary condition for development, it is not sufficient on its own, and a broader approach that addresses these underlying factors is needed to achieve sustainable economic progress.

4.1.2 Critical Minimum Effort Thesis: Leibenstien

The Critical Minimum Effort Theory was proposed by Harvey Leibenstein in 1957. The theory states that that underdeveloped countries are trapped in poverty due to low income. To break this cycle, a 'critical minimum effort' is needed to stimulate economic growth and increase per capita income. This effort must be big enough to push the economy forward and achieve steady growth.

4.1.2.1 Shocks and Stimulants

According to Leibenstein, every economy is under the influence of two forces - 'shocks' and 'stimulants'. Shocks refer to those forces which reduce the level of output, income, employment and investment, etc. In other words, shocks dampen and depress the development forces. Shocks depress development forces, which reverse the wheel of development.

On the contrary, stimulants refer to forces that raise the levels of income, output, employment, and investment. In other words, Stimulants impress and encourage development forces. They are called 'Income Generating forces' which lubricate the wheel of development. Stimulants have the capacity to raise per capita income above the equilibrium level.

The long-run economic development does not take place in backward and undeveloped countries, as the magnitude of stimulants in those countries is quite small. A country is said to be underdeveloped if the impact of shocks is stronger than the impact of stimulants. On the contrary, a country is said to be developed if the impact of shocks is weaker than the impact of stimulants. Thus, the efforts to escape from economic backwardness - whether spontaneous or forced - fall below the critical minimum effort required for sustained growth. The theory of critical minimum effort has been illustrated in Figure 4.1.1.

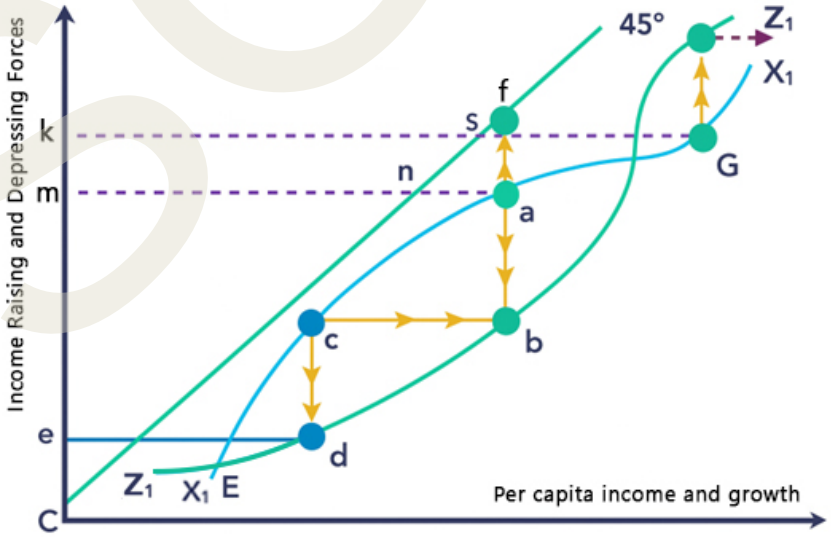

Fig. 4.1.3 Critical Minimum Effort

The diagram explains why some countries remain poor while others achieve sustained economic growth. In the figure the horizontal axis represents per capita income, while the vertical axis represents the income-raising and income-depressing forces. The 45-degree line shows where income-raising and depressing forces are equal, resulting in no change in per capita income. The Z_1 curve represents factors like savings and investment that increase income, and as income rises, growth potential also increases. The X_1 curve represents forces like rapid population growth that decrease income per person. These forces may initially increase with better living standards, but then stabilize or decline.The intersection point 'E' represents a low-level equilibrium trap where a country's income is too low to grow because problems like high population growth are too strong.

However, if a country can mobilise a significant 'push' or investment (like the upward movement from 'c' to 'b'), it might cross a critical threshold where the income-raising forces (Z_1) become significantly stronger than the depressing forces (X_1), allowing per capita income to rise steadily towards higher levels, potentially reaching a more favorable equilibrium like 'G' and enabling sustained economic development.This required amount of investment, which raises per capita income enough to trigger self-sustaining growth, is what Leibenstein called the 'Critical Minimum Effort.'

Attitudes and Motivations

Leibenstien suggests that the generation of stimulants depends upon the motivations and attitudes of the people and the incentives given to them. The main factors of development are entrepreneurs, investors, discoverers, people who can disseminate knowledge, etc. According to Leibenstein, there are two types of incentives that are found in the underdeveloped countries:

i. Zero-sum Incentives.

ii. Positive sum Incentives.

Zerosum incentives and Positive Sum Incentives

With a zero-sum incentive, one person's gain is another's loss, so the total outcome does not change. In contrast, a positive-sum incentive allows everyone to benefit, making the overall outcome better for all involved.

4.1.3 Low Level Equilibrium Trap: Nelson

Richard R. Nelson's 'Low Level Equilibrium Trap' theory (1956) states that poor countries remain poor due to a vicious cycle of poverty, where limited resources and low income hinder economic growth. To break this cycle, Nelson advocates for a minimum level of investment to stimulate economic development. He recommends a 'Balanced Growth Strategy,' involving large, coordinated investments across various sectors to match demand and support each other. Additionally, Nelson identifies common structural problems in poor countries, including: low savings and investment rates, limited infrastructure, inadequate human capital, and inefficient markets. These issues hinder economic growth and development, making it challenging for poor countries to

escape the poverty trap. By addressing these problems through balanced investments, countries can overcome the low level equilibrium trap and achieve sustainable economic growth.

He postulated that population growth is a function of the per capita income of the country. There exists a positive relationship between population growth and per capita income at the initial stages of development, i.e., as the per capita income increases, the rate of growth of population also increases. After that, with an increase in per capita income, the rate of growth of population is constant till a certain level. Beyond that level, with a further rise in the per capita income, population growth will fall.

He postulated that addition to the capital stock takes place in two forms. One by the increase in the quantum of natural resources, which he assumes to be negligible and second by the savings created capital per capita (the latter is roughly the same as investment in the industrial sector, i.e, it represents additions to the stock of tools and equipment). Hence, he assumes that addition to the capital stock is equal to savings created capital per capita, which assumes the following relationship with per capita income.

According to Nelson, the UDCs are in a low-level equilibrium trap. At this low and stable equilibrium, both the rate of saving and investment are low. If PCI increases above the minimum subsistence level, it encourages a growth of population. The population growth, in turn, pushes down the PCI to the minimum subsistence level. Thus, the economy is caught up in a low-level equilibrium trap.

To get out of this trap, the rate of increase in per capita income should be greater than the rate of increase in population. The following are the conditions causing the low level of the equilibrium trap.

- A high correlation exists between levels of PCI and the range of population growth.
- A low propensity to direct additional PCI to increase per capita investment.
- Scarcity of uncultivated arable land and
- Inefficient production methods
- Cultural inertia and economic inertia.

Measures to Escape from the Low-level Equilibrium Trap

- A favourable socio-political environment in the country
- Capital and income should be enlarged through funding from abroad and solid investment by the government.
- Improved techniques to utilise the resources.

4.1.4 Rostow's Stages of Growth

Theorists of the 1950s and 60s viewed the process of development as a series of successive stages of economic growth through which all countries must pass. The most influential and outspoken advocate of the stages of growth was the American economist and historian, W. W. Rostow. According to Rostow, the transition from underdevelopment to development can be described in terms of a series of steps and stages through which all countries must go. In his book, *The Stages of Economic Growth* (1960), Rostow presents an economic historian's way of generalising the sweep of modern history. This book represents an attempt to provide an alternative to the Marxist interpretation of history, hence its subtitle, 'A Non-Communist Manifesto'. His theory is based on the Euro-American experience.

Rostow's core idea is that all countries follow a standard path of development, moving through five clear stages, and each country can be classified based on the stage it is in.

1. The Traditional Society
2. The Preconditions for Take-Off
3. The Take-Off
4. The Drive to Maturity
5. The Age of High Mass Consumption

1. The Traditional Society

Rostow said that a traditional society has a simple way of producing goods. It is based on old science and technology that existed before Newton's time. People in such societies also have traditional beliefs about the physical world. According to him, traditional societies used old and basic technology. People followed strict and traditional beliefs. They did not have modern science and technology. People used simple tools for their work. Their economic activities were small and only meant to meet the needs of their own families.

Traditional society was not static in character; there were possibilities of economic change in such a society. The basic characteristics of the traditional society.

- Agriculture was carried on with the primitive method of production.
- The law of diminishing returns operated in agriculture.
- There was an absence of modern science and technology.
- The structure of the society was based on inheritance.

- The political power was concentrated in the hands of big landlords.

These characteristics clearly indicate the economic, social, and political structure of the traditional society. The study of such societies is important because it provides an opportunity to diagnose the problems of development.

2. The Preconditions for Take-Off

This second stage of growth is actually a process of transition, which involves changes in the economic, social, and political structure of the traditional society. These changes enable the society to exploit the fruits of modern science and prevent the operation of diminishing returns. During this stage, education spreads, mental horizon broadens, and economic activity expands. New enterprising men come forward, banks and other institutions appear, investment increases, the scope of commerce widens; but all this activity proceeds at a limited pace within an economy and society still characterised by low productivity methods. According to Rostow, a precondition for take-off is an era which society prepares itself for sustained growth.

Rostow has suggested that preconditions for take-off require radical changes in the three non-industrial sectors.

1. There should be expansion of social overhead capital, i.e., development of transport, communication, roads, etc.

2. Radical changes should take place in agriculture so as to raise its productivity. The rise in agricultural productivity is essential to sustain industrialisation and to meet the requirements of a growing population.

3. There should be an expansion of foreign trade. Foreign capital and technical know-how help sustain industrialisation in the initial stages of development. Exports and imports help in widening the extent of the market and thereby promoting industrialisation.

Briefly, pre-conditions for take-off require the evolution of modern science and technology, a rational and scientific attitude of the people, expansion of social overhead capital, particularly transport, rising agricultural productivity, a large extent of market and expansion of internal and external trade.

3. The Take-off

The various factors discussed in the second stage prepare the ground for the third stage of economic growth, i.e. the take-off. These factors reveal that the growth of one sector leads to the expansion of other sectors. The expansion of different sectors transforms the basic structure of an economy, and it starts moving on the road to self-sustained growth.

Rostow described the 'take-off' stage as the point when a country begins self-sustained economic growth. During this stage, the rate of investment rises sharply, leading to an increase in output per person. This growth brings major changes in production methods and how income is used, which helps maintain the higher level of investment and continued growth.During take-off, many radical changes take place. Industries expand

rapidly, yielding profits. Profits are invested in the setting up of new industries, and the expansion of new industries stimulates demand for manufactured goods and factory workers. Expansion of industries helps raise the demand for agricultural products, thereby ensuring the development of rural areas.

Rostow has suggested the following three related conditions for making the growth process self-sustaining:

1. A rise in the rate of productive investment from about 5% or less to over 10%.
2. The development of one or more leading manufacturing sectors with a high rate of growth;
3. The existence or quick emergence of a political, social and institutional framework which exploits the impulses to expansion in the modern sector.

Rostow argued that the start of the take-off stage in most countries was triggered by a specific event or stimulus. This could be a technological breakthrough or a political change. For example, Germany's take-off began after the 1848 revolution, Japan after the Meiji Restoration in 1868, China after the 1949 revolution, and India after gaining independence in 1947. According to Rostow, Britain's take-off happened in the two decades after 1783; France and the United States experienced theirs in the decades before 1860; Germany in the third quarter of the 19th century; Japan in the last quarter of the 19th century; and Russia and Canada in the 25 years leading up to 1914. India and China began their take-off stages in the 1950s.

4. The Drive to Maturity

This stage marks the period when a society successfully uses modern technology across most of its resources. Industrial development becomes more advanced, with new key industries gaining strength while older ones begin to decline. For example, sectors like cotton textiles, railways, and coal lose importance, and new industries such as steel, shipbuilding, chemicals, electricity, and machine tools become the main drivers of growth. These new industries improve efficiency, which spreads to other parts of the economy. During this stage, around 10 to 20% of the national income is regularly invested, allowing economic output to grow faster than the population.

The social structure undergoes a change. The percentage of people engaged in agricultural activities diminishes; it progressively increases in industrial activities. The Economy comes to occupy an important place in the international economy. Goods which were formerly imported are produced at home with improved technology. New import requirements develop, and new export commodities are produced to finance them. In brief, economic maturity is reached when growth becomes a habit and routine matter in every sector of the economy. Rostow believes that an economy can attain technological maturity in sixty years after the beginning of take-off or forty years after achieving the take-off. Specifically, three things happened as maturity moved towards its close.

- **The Composition of Working Force Changes:** This class becomes more skilled. Their real wages rise. Their attitudes, habits and patterns of consumption undergo a change.

- **The Character of the Leadership Changes:** During maturity, the control of industries passes into the hands of efficient and polished managers. The employers and employees consider themselves as co-partners in the enterprises. Industrial peace and social security become the hallmark of the maturity phase of the society.

- **The Society Aspires for New Things:** As the maturity phase of the economy comes to a close, the society becomes fed up with the miracles of industrialisation and starts aspiring for something new. In short, the maturity phase offers new and promising choices with new problems.

5. The Age of High Mass Consumption

After reaching economic maturity, a country enters the stage of high mass consumption. At this point, people begin to desire more leisure, better social welfare, and greater security, rather than just the benefits of industrial growth. To meet these needs, society starts to spend more resources on providing such services, taking on the role of a welfare state. During this stage, there is a major focus on producing durable consumer goods and services that are widely used by the public. Rostow explained this stage as a shift in focus - from solving problems of production to addressing issues of consumption and overall well-being. He stated that as societies move beyond maturity, their priorities move from increasing supply to meeting the growing demands of consumers. Rostow also identified three main ways in which overall welfare could be improved.

- First, large resources should be allocated to military and foreign policies for achieving international recognition and external power and influence.

- Second, the resources of a mature economy should be directed to promote the welfare of society.

- Third, the state should direct its resources to the expansion of the consumption levels beyond basic food, shelter and clothing into the range of mass consumption of durable consumer goods and services. In the 1950s ,Western Europe and Japan appeared to have fully entered this phase.

Critical Evaluation

Rostow's theory provided a valuable description of the development process and pointed out some prominent variables in the process of growth. The mechanisms of development included in the theory of stages of growth did not always work. This is because of the fact that capital accumulation is only a necessary condition for accelerated economic growth, but not a sufficient condition. The Marshall Plan worked well in Europe because these countries possessed the necessary structural, institutional and attitudinal conditions to convert new capital effectively into higher levels of output. But in developing countries, these conditions are terribly lacking. Rostow's theory suffers from many other weaknesses.

- A linear conception of history and development is misleading (Meier)

- Stages are not distinct, and they often overlap

- There is the difficulty of empirically testing the theory (Caimcross)
- Rostow's figures of investment and the incremental capital output ratio during the takeoff are questionable (Kuznets)
- Not successful in refuting Marx's concept of development
- It is a 'Eurocentric model' suggesting that all countries will imitate the experience of Europe and America

Despite these points of criticism, Rostow's stage theory still offers valuable insights into the development process. Rostow's expressions like 'take-off and self-sustained growth are thoroughly entrenched in the development literature.

4.1.5 Balanced and Unbalanced Growth

The Balanced Growth Theory is an economic theory pioneered by the economist Ragnar Nurkse (1907–1959). The theory hypothesises that the government of any underdeveloped country needs to make large investments in a number of industries simultaneously. This will enlarge the market size, increase productivity, and provide an incentive for the private sector to invest.

Nurkse was in favour of attaining balanced growth in both the industrial and agricultural sectors of the economy. He recognised that the expansion and inter-sectoral balance between agriculture and manufacturing are necessary so that each of these sectors provides a market for the products of the other and, in turn, supplies the necessary raw materials for the development and growth of the other.

One major controversy in development economics concerns the choice of development strategy. There are two alternative strategies. First is the balanced growth strategy, and the second is the unbalanced growth strategy. Investment should be made in different sectors of the economy. The concept of balanced growth advocates a balanced growth strategy. According to Nurkse, there exists a vicious circle of poverty in UDCs. To break the vicious circle of poverty, from the demand and supply sides of capital formation, by enlarging the market size, simultaneous application of capital to a wide range of industries is needed. A wide range of projects in different industries may succeed as they support each other. According to Rodan, there exist complementarities, indivisibilities, etc, planned industrialisation and a big push in the form of large investment will produce the necessary development in the economy.

The doctrine of balanced growth requires three types of balance:

- Balance in demand
- Balance in supply
- Sectoral balance

Sectoral balance means the balance between agriculture and industry, the balance between human capital and material capital balance between domestic trade and foreign trade.

Essential Conditions of Balanced Growth

- State intervention
- Planning
- Coordination among different departments of the government
- Public cooperation

Unbalanced Growth Strategy

Albert Hirschman has given a scientific illustration of the unbalanced growth strategy (UBG). Prominent economists who supported and contributed to this development theory include Hirschman, Singer, Rostow, Kindleberger, and Paul Streeten. Hirschman believed that due to the limited resources in underdeveloped countries (UDCs), the most effective way to speed up economic development is by intentionally creating imbalances in the economy. This means focusing investment in certain key areas to stimulate growth and encourage further development. Hirschman argued that unbalanced growth could be an effective strategy for underdeveloped countries, though it was not explicitly followed by Western economies.

Development, according to Hirschman, is a continuous process of imbalances that should be maintained rather than removed. In a competitive economy, profits and losses are signs of these imbalances. To keep the economy growing, development policies should aim to preserve these tensions, disproportions, and imbalances, as they drive further progress.

Some economists suggested that sustained development requires investment to reach at least 10% of national income, though this was not part of Hirschman's unbalanced growth theory itself. H.W. Singer emphasised that investment should focus on creating social overhead capital (SOC) and removing specific obstacles or bottlenecks in the economy to make the development process more practical and effective.

The UBG strategy stands for investment in the leading sector where there are maximum linkage effects and induced decisions for investment. According to Hirschman, underdeveloped countries (UDCs) suffer from a shortage of capital. Therefore, investment should be focused on a few key strategic and leading sectors. The aim is to choose areas that can generate further investment opportunities and promote overall economic development. Growth in these leading sectors will gradually spread to other parts of the economy - from one industry to another and from one firm to the next. Development is the result of a series of investments in leading sectors.

Two series of investment:

1. Convergent series of investment
2. Divergent series of investment

These two types of investment are explained using the ideas of appropriation and creation of external economies. When a project benefits more from existing external

economies than it creates, it is called a convergent series of investment. In contrast, when a project creates more external benefits than it receives, it is called a divergent series of investment. Each type is driven by different motives. Convergent investments are motivated by private profit and are usually made by individual investors in directly productive activities (DPA). Divergent investments are guided by social benefits and are generally undertaken by public agencies in social overhead capital (SOC), such as infrastructure, education, or public health.

Unbalancing the Economy with SOC

Investing in social overhead capital (SOC), such as infrastructure and basic services, helps encourage investment in directly productive activities (DPA). In this approach, more SOC is built to support and attract DPA investments. According to Hirschman, certain SOC investments are necessary before DPA investments can take place. This pattern, where investment flows from SOC to DPA, is known as pressure-relieving investment or development through excess capacity.

Unbalancing the Economy with DPA

Another alternative is to create an imbalance in the economy by investing first in DPA. The shortage of SOC creates political pressure to establish the required SOC. In that case, pressures and tensions are bound to arise during the course of development. The sequence of investment from DPA to SOC is therefore called pressure creating investment or development via shortages.

Hirschman believed that the main problem in developing countries is not the lack of resources, but the lack of capacity to use those resources effectively for development. The route of development via shortage of SOC is a discontinuous and difficult one. Hirschman believed that development through shortage follows a disorderly and forced sequence, where growth happens under pressure. In contrast, developments through excess capacity allow for a more flexible and smooth process, as it creates room for future growth. Hirschman advocates that there should be leading sectors where induced decision making is the Maximum.

Linkage Effects

Hirschman suggests that in the selection of the industries, those industries where the linkage effects (forward and backward linkage effects:) are maximum should be selected for investment. An industry's output is used as input by other industries, stimulating their growth is known as forward linkage and an industry's production creates demand for inputs (raw materials, labor, etc.) from other industries, boosting their growth is known as backward linkage.

4.1.6 Concept of Dualism

Dualism is a concept widely discussed in development economics. The term dualism describes a condition in which developing countries may find themselves in the early stages of development. It represents the existence and persistence of increasing divergences between rich and poor nations and rich and poor people on various levels. Dualism refers to economic and social divisions in an economy, such as differences in the level of technology between sectors or regions, differences in the degree of geographic

development and differences in social customs and attitudes between an indigenous and an imported social system. Underdeveloped countries are characterised by a dualistic economic structure in which the modern sector (consisting of industrial enterprises, plantations, transport, mining, etc.) develops side by side with the traditional sector (comprising agriculture, petty trade, cottage industry, informal labour services).

Dualism, in all its forms, is closely linked to the growth of a money-based economy. It can occur naturally due to specialisation within the economy or be introduced from outside through the influence of a foreign economic system, such as capitalism.

4.1.6.1 The Theory of Social Dualism

J.H. Boeke's theory of social dualism describes the conflict between a foreign social system, often advanced capitalism, and a traditional native system. This clash can occur when different economic and social structures meet, leading to potential disruptions. Boeke observed this phenomenon in Indonesia, but notes it can happen in other countries too, involving various foreign systems like socialism or communism.According to him, there is a contrast between two economic systems: the advanced, modern Western economy and the traditional, underdeveloped Eastern economy. The Western system is characterised by modern techniques and a high standard of living, while the Eastern system is marked by outdated methods and limited social and economic development, resulting in a clash between the two systems.This contrast is refered to as social dualism

Features of Social Dualism

1. **Limited Needs:** The foremost characteristic of the Eastern economy is the prevalence of limited wants, whereas Western society is characterised by unlimited wants. In contrast to this, Western society has unlimited needs. The reason for limited needs is that people are very simple and unsophisticated. They are content with the satisfaction of their immediate needs. In these economies, people have simple lifestyles and limited needs. Once they earn enough money to meet these basic needs, they prefer to take more rest instead of working more. As a result, the supply of labour tends to decrease when wages rise beyond a certain point. This means that instead of working more for higher wages, people choose more leisure time, causing the labour supply curve to slope backward.

2. **Overriding importance of Social Needs:** In an Eastern society, social needs are important. People work for social needs rather than for economic needs. For example, if three acres are enough to supply the needs of a household, he will not cultivate six acres. According to Prof. Boeke, the value of goods is not based on how useful they are or the services they provide to the owner. Instead, their value depends on what the community as a whole thinks about those goods.

3. **Absence of Enterprising Spirit:** In Eastern societies, there is a lack of interest in profit-seeking activities. People often engage in speculative actions and show little focus on activities that generate steady profits. According to Boeke, Eastern industries tend to avoid capital investment because of a strong dislike or fear of taking financial risks. In general, industrial development in these societies is shaped by attitudes of fatalism and acceptance of one's fate, rather than by ambition or the desire to grow.

4.1.6.2 The Theory of Technological Dualism

Professor Higgins has developed the theory of technological dualism. The underdeveloped countries of today are characterised by a dualistic Economy. One is the modern sector, the other is the traditional sector. He explains the theory of technological dualism with the co-existence of the traditional sector using traditional technology and modem sector using modern technology in underdeveloped countries. In this context, dualism is a situation in which productive employment opportunities are limited not because of a lack of demand, but because of resource and technological restraints in two sectors.

There are two fundamental bases of technical dualism, according to Prof. Higgins:

1. **Differences in Factor-Endowment:** One of the main reasons for technical dualism is the difference in the availability of capital and labour. In dual economies, the traditional sector usually has plenty of labour but very little capital. As a result, this sector uses labour-intensive production methods. On the other hand, the modern sector has more capital than labour, so it uses capital-intensive techniques. This creates two separate types of production methods in the two sectors of the economy.

   Capital is scarce from both the demand and supply sides. On the supply side, low incomes lead to low savings, which limit capital formation. On the demand side, the small size of the market and low productivity reduce the need for large investments. This creates a vicious cycle that keeps the level of capital low in the economy.

2. **Discontinuity between Sectors:** The lack of linkages or integration between the modern and traditional sectors, leading to a disconnect in technological development, productivity, and economic growth.

4.1.6.3 Cumulative Causation Thesis or Geographical Dualism

The Cumulative Causation Theory, developed by Swedish economist Gunnar Myrdal,explains why many developing countries face persistent underdevelopment. It is mainly a theory of geographical dualism, which applies to both countries and different regions within a country. This theory helps to understand why differences in development indicators, uch as per capita income, industrial growth, trade, employment rates, and levels of unemployment, continue to exist between regions or nations over time.

Myrdal believed that in the process of development, social and economic forces often lead to imbalances or disequilibrium. These imbalances do not automatically correct themselves or bring the system back to balance. As a result, gaps in income and living standards between countries continue to grow. To explain this, Myrdal replaced the idea of a stable equilibrium with the concept of circular and cumulative causation, which means that once a region starts to develop or fall behind, the effects build up over

time. This helps explain the continued and growing differences in development both between countries and within different regions of a country.

Growth-Retarding Effect

In Myrdal's view, geographical dualism operates through 'backwash effects' such as labour migration, capital flows, and trade, which strengthen developed regions while weakening lagging ones. This dynamic can retard not only the growth of less developed regions but also limit balanced progress in the entire economy. To understand the idea of circular and cumulative causation, imagine a country where all regions are at the same level of development. Now, suppose an external event—like a crop failure—causes an imbalance, leading one region to develop faster than the others. Over time, certain economic and social forces will make this imbalance worse, helping the more developed region grow even more, while the less developed areas fall further behind. As a result, the backward regions may continue to decline, and their chances of future development are reduced.

Myrdal's theory stands in contrast to the Neoclassical Equilibrium approach, which assumes that factor mobility automatically restores balance across regions. The Neoclassical Theory assumes that through the process of factor mobility, wage rates and the rate of profit will equalise across regions. As per their theory, in places where labour is scarce and capital is abundant, labour will flow in and capital will flow out.

Recap

- The theory of social dualism is associated with J. H. Boeke
- According to Rostow, savings and capital formation (accumulation) are central to the process of growth, hence development
- Myrdal holds the view that in the context of development, both social and economic forces produce tendencies towards disequilibrium
- The key to development is to mobilise savings to generate the investment to set in motion self-generating economic growth
- Balanced growth involves the simultaneous expansion of a large number of industries in all sectors and regions of the economy
- The balanced growth (or "big push") theory argues that when a large number of industries develop simultaneously, each creates a market for the others
- Unbalanced growth theorists argue that sufficient resources cannot be mobilised by the government to promote widespread, coordinated investments in all industries

- According to Nelson, the UDCs are in a low-level equilibrium trap
- Professor Higgins has developed the theory of Technological Dualism
- According to Nurkse, a vicious circle implies a circular constellation of forces tending to act and react upon one another in such a way as to keep a poor country in a state of poverty

Objective Questions

1. According to Lewis's model, the dual economy grows only when?
2. What features characterise dual economies?
3. What the Vicious Circle Theory state?
4. Which are Rostow's economic stages?
5. According to W. W. Rostow, what are the stages of economic growth?
6. Who put forward the Theory of Social Dualism?
7. Who coined the phrase 'demonstration effect'?
8. What does balanced growth imply?
9. Who formulated the development hypothesis of unlimited supplies of labour?
10. With which of the following kinds of dualism is H. Myint particularly associated?

Answers

1. The modern manufacturing sector is labour-intensive
2. A modern manufacturing sector as well as the traditional agriculture sector
3. Low per capita income creates low savings that keep incomes low
4. The traditional society, the preconditions for take-off, the take-off, the drive to maturity, and the age of high mass consumption

5. Five
6. J.H.Boeke
7. James Duessenberry
8. Different sectors are growing at their natural rates of growth.
9. W.A Lewis
10. Financial dualism

Assignments

1. Explain the concept of the Vicious Circle of Poverty.
2. Critically examine the Critical Minimum Effort Thesis.
3. Discuss the Low-Level Equilibrium Trap.
4. Compare and contrast Balanced and Unbalanced Growth strategies. Which approach is more suitable for accelerating growth in a developing economy like India? Justify your answer.
5. Define the concept of Dualism. How do social, technological, and geographical dualism affect development outcomes in less developed countries?

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Sustainable Development

Learning Outcomes

After completing this unit, the learner will be able to:

- define sustainable development and its components
- describe the rules and approaches of sustainable development
- comprehend the Sustainable Development Goals (SDGs)

Prerequisites

Sustainable development, defined by the Brundtland Commission in 1987, aims to meet the needs of the present generation without compromising the ability of future generations to meet their own needs. This concept is built on three interconnected components: social, economic, and environmental. The social component emphasises equal access to environmental resources and social justice, while the economic component focuses on increasing production, productivity, and poverty eradication. The environmental component prioritises maintaining a resourceful environment, preserving natural resources, and effective resource management. To achieve sustainable development, we must follow specific approaches, including environmental appraisal, impact estimation, natural resource accounting, and supportive government policies. The 17 SDGs adopted by the UN in 2015 provide a framework for nations to work towards a more sustainable future, addressing challenges like poverty, inequality, climate change, and environmental degradation.This change did not occur overnight. It emerged slowly, step by step, through innovations, discoveries and the growing needs of people who wanted better ways to buy, sell and interact. What once seemed impossible, like ordering a product from across the world and receiving it in days, is now an everyday reality. And with this new reality, comes a new way of looking at business, commerce and society.

Keywords

Sustainable Development, Brundtland Commission, Zero Hunger, Sustainable Development Goals, Our Common Future

Discussion

4.2.1 Concept and Meaning of Sustainable Development

The concept of sustainable development was popularised by the World Commission on Environment and Development, also known as the Brundtland Commission, in its 1987 report Our Common Future. In this report, sustainable development was defined as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs."

This definition includes three important ideas: needs, development, and future generations.

- Needs refer to the basic necessities of life, such as food, clothing, and shelter. These are different from wants. Sustainable development encourages using the Earth's resources to meet only these basic needs.
- Development means using resources in an efficient and effective way so that our economic activities remain balanced and long-lasting.
- The principle of intergenerational equity highlights our moral duty to protect and preserve the environment so that the next generations also have access to the resources they need.

In short, sustainable development is about meeting today's needs responsibly while ensuring a healthy, resourceful environment for tomorrow.

4.2.1.1 Components of Sustainable Development

Sustainable development rests on three interrelated components such as social, economic, and environmental. These components are closely connected, and any damage to one will inevitably affect the others. Development can be considered sustainable only when the objectives of all three are pursued together in a balanced manner.

- **Economic Component:** The economic component of sustainable development emphasises inclusive growth, poverty reduction, innovation, and efficient use of resources. Its objectives include increasing production and productivity, ensuring rapid and well-planned economic development, and eradicating poverty through the creation of opportunities. Economic sustainability also involves promoting innovation, efficiency in resource use, and policies that

support long-term stability.

- **Social Component:** The social component focuses on equity, justice, and inclusiveness in development. It seeks to ensure fair access to natural resources so that both rich and poor are able to meet their basic needs. It also emphasises the attainment of social justice, reduction of inequalities, and improvement in human well-being through better health, education, and community participation. By addressing these objectives, the social pillar ensures that development is not only economically sound but also people-centred.

- **Environmental Component:** The environmental component aims at preserving the natural systems that support life. Its objectives include the conservation and sustainable use of natural resources, effective resource management, and the protection of ecosystems and biodiversity. It seeks to maintain a healthy and resilient environment that can support both present and future generations.

Sustainable development is achieved only when the objectives of the economic, social, and environmental components are satisfied simultaneously. Together, these three pillars form the foundation of a development process that ensures prosperity, equity, and ecological balance for present and future societies.

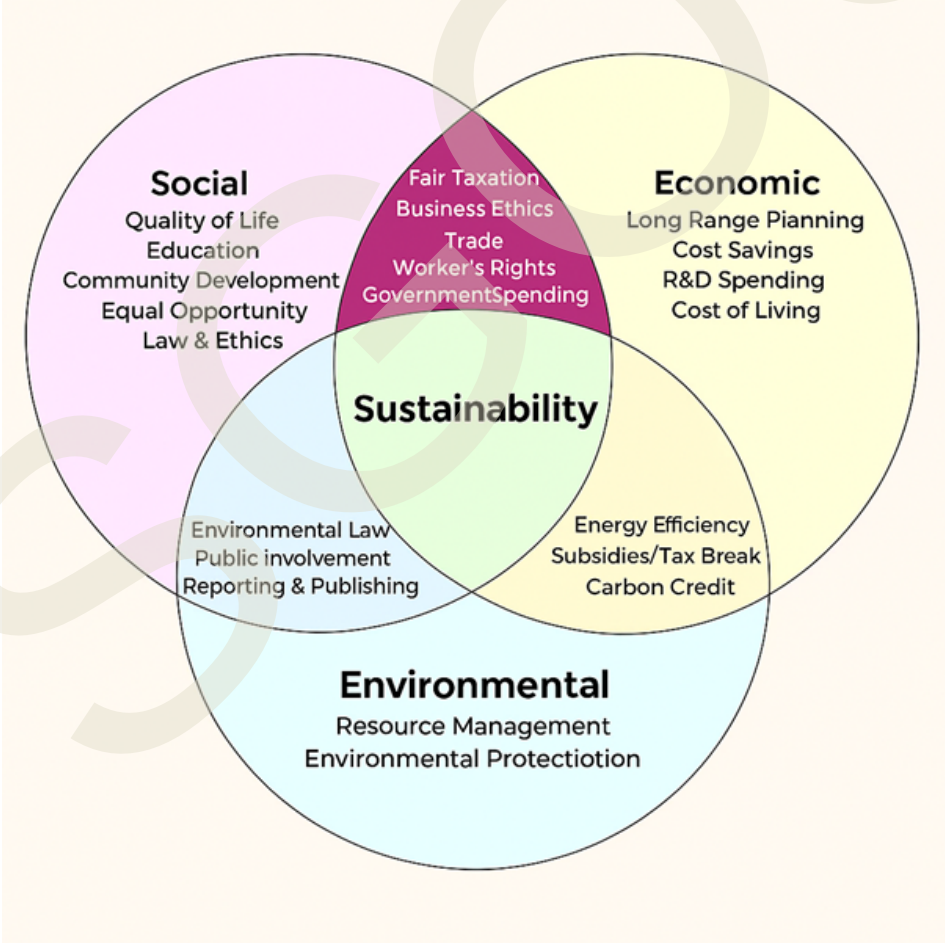

Figure 4.2.1 Components of Sustainable Development

4.2.1.2 Rules of Sustainable Development

The aggregate capital stock should not decline over time is the rule of sustainability. We can divide this rule into two categories. They are weak sustainability rules and strong sustainability rules. It can be discussed as below.

Weak and Strong Sustainability Rule

The rule of sustainability may be either weak or strong, depending on the substitutability of capital. The general rule of sustainability is that the aggregate capital stock should not decline over time. The rule of sustainability is classified as weak or strong, depending on the degree of substitutability among different forms of capital. To attain sustainability, the total capital stock will remain constant. Natural capital includes all natural resources such as air, water, forests, fisheries, etc. Man-made capital means all man-made appliances like machines, tools, buildings, etc. Human capital means the efficiency, skill, knowledge, information, etc.

According to Weak sustainability, the sustainability rule is that we can substitute one capital for another, and we can maintain the aggregate capital stock at a constant level. In the development process, any decline in stock of one capital is compensated by the expansion of other capital stock. Then, the total capital stock can be maintained as before. For example, suppose for industrial purposes, we cleared a forest land, and in that place constructed an industry. According to the weak sustainability rule, there will be no reduction in total capital. That is, any reduction in natural capital (forest) can be compensated with the expansion of man-made capital (Industry). Therefore, according to the weak sustainability rule, aggregate capital should not decline over time due to the possibility of substitutability between capital.

Strong Sustainability Rule insists that aggregate natural capital should not decline over time. Natural capital is extremely critical in nature; therefore, any type of substitution or compensation is not possible in the case of natural resources. Then, according to this view, a development is said to be sustainable when there is a constant stock of natural resources. For example, if we are creating more nets to catch fish. But overcatching of fish reduces its population. Then if we are producing more and more nets, the man-made capital is increasing at the same time, natural capital is declining. But we cannot substitute net with fish. So, natural resources are critical or very essential resources for the existence of life on this earth. So, the maintenance of a constant stock of natural capital is an indicator of sustainable development.

To attain sustainable development, we must follow certain approaches. They are illustrated below;

1. **Appraisal of the Environment**: One of the prerequisites for the initiation of any sustainable developmental project is the appraisal of the environment. Societal development is closely related to the economic order and bio-physical condition of that area. By investigating such a relationship, we can prepare an action plan for the implementation of developmental projects.

2. **Estimation of the Environmental Impacts**: Wise use of environmental resources is essential to attain sustainable development. The development which creates complete harmony between the environment and society will bring sustainable development. To achieve this goal, different ecological inputs should be accurately assessed and monitored. Therefore, the estimation of environmental impacts is the study of the interrelationship between natural systems and the development process.

3. **Natural Resource Accounting:** Natural resource accounting is mandatory for sustainable development. Because of the interlinkage between ecology and economy, any loss in ecology must hamper economic prosperity. Such losses directly affect national productivity and national income. Sustainable development requires a more precise and delicate accounting system than the traditional one. The United Nations system of national accounts (SNA) is now a widely accepted method of natural resource accounting.

4. **Government Policies and Economic Outlook**: Lack of uniformity in government policies hamper sustainability in development. Lack of price incentives, absence of information campaigns, and the dearth of integrated, coherent development policies may block sustainable development. Exploitative use of natural resources should be stopped by imposing taxes or abolishing subsidies.

4.2.2 Relevance of Sustainable Development

The idea of sustainable development, popularised by the Brundtland Commission in its report *Our Common Future* (1987), is more relevant today than ever before. It defined sustainable development as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* This principle emphasises two critical concerns: equity between present and future generations, and the balance between economic growth and environmental limits.

In the 21st century, global challenges such as climate change, biodiversity loss, water scarcity, urbanisation, and social inequality have made the goals of sustainable development central to policymaking. With the world's population projected to approach 9 billion by 2050, societies face the task of providing food, energy, and livelihoods for all while ensuring that natural systems are not irreversibly degraded. This shows that sustainability is not only an ethical obligation but also a practical necessity for long-term survival and prosperity.

The relevance of sustainable development lies in its integrated approach, which combines three interdependent objectives:

- Economic growth to improve living standards and reduce poverty,
- Environmental protection to safeguard ecosystems and resources, and
- Social inclusion to ensure equity, justice, participation and respect for human rights.

These dimensions apply across all sectors such as transportation, agriculture, energy,

infrastructure, and urban planning, making sustainability a guiding framework rather than a sector-specific strategy.

The Brundtland Commission's work paved the way for global cooperation on environmental and development issues, ultimately leading to the adoption of the 2030 Agenda for Sustainable Development and the 17 Sustainable Development Goals (SDGs), which came into effect on 1 January 2016. These goals address urgent priorities such as ending poverty, reducing inequality, tackling climate change, and conserving natural resources. Their universal adoption highlights that sustainability is not optional, but essential for human well-being and ecological balance. Moreover, sustainable development is highly relevant in addressing present-day crises. Extreme weather events, rising sea levels, deforestation, and depletion of fisheries demonstrate that unchecked exploitation of resources threatens both economies and societies. At the same time, sustainable practices, such as renewable energy adoption, circular economies, and inclusive social policies, offer pathways to resilience and long-term prosperity.

Sustainable development is not a final destination but an ongoing process. It requires democratic governance, strong socio-economic institutions, and cooperation between nations, communities, and individuals. Its continuing relevance lies in guiding us to grow without destroying the very foundations of life, ensuring that progress today does not compromise the opportunities of tomorrow.

The Sustainable Development Goals (SDGs) are 17 interlinked global goals designed to achieve a better and more sustainable future for all. It is also called the Global Goals In 2015, all member countries of the United Nations adopted the Agenda for Sustainable Development. It includes 17 goals aimed at ending poverty, improving health and education, reducing inequality along with tackling climate change and protecting all kinds of natural resources, including oceans and forests, and it is an urgent call for action by all kinds of nations with a global partnership. Important goals of sustainable development are given below.

1. **No Poverty:** The first goal of sustainable development is to end poverty in all its forms everywhere. From the world estimates, the number of people living in extreme poverty has reduced from 36 per cent in 1990 to 10 per cent in 2015 globally. But the speed of change is decelerated due to the widespread of Covid-19. The research conducted by the World Institute for Development Economics Research warns that globally spread Covid-19. For thirty years from 1990, during the pandemic, poverty increased such a high level. This goal aims that economic growth must be inclusive to provide sustainable jobs and promote equality.

2. **Zero Hunger:** The second goal of sustainable development is Zero Hunger. It means the food and agriculture sector offers key solutions for development and is central to hunger and poverty eradication. From 2015 onwards, the undernourishment, the symbol of hunger, began to slowly increase. Current estimates show that nearly 690 million people are hungry or 8.9 per cent of the world population, are getting hungry. But to achieve this goal of zero hunger in 2030 is a greater task because, in recent years, especially because of the

pandemic, the number of people affected by hunger would surpass 840 million by 2030. Increasing agricultural productivity and sustainable food production are crucial to alleviating the perils of hunger.

3. **Good Health and Well-being:** To attain sustainable development, good health and well-being for all is essential. Currently, the world is facing a global health crisis in the form of the Covid-19 pandemic. Before the pandemic, major progress was made in improving the health of millions of people. But more efforts are needed to fully eradicate a wide range of diseases and many emerging health issues.

4. **Quality Education:** Obtaining or providing quality education is a fundamental thing to attain sustainable development. All of you know that education enables us to reach the highest ladder of socio-economic development and is a key element in reducing poverty. Over the past years, good improvement has been made towards increasing access to education and enrollment of students in schools, particularly girls. Nevertheless, about 260 million children were still out of school in 2018, and more than half of the children and adolescents worldwide are not meeting the basic standards in reading and mathematics.

5. **Gender Equality:** To attain a peaceful, prosperous, and sustainable world, gender equality is a must, and it is also a fundamental human right. Currently, there has been more progress in this regard worldwide. More girls are getting a school education, more women are reaching leadership positions, and laws are being reformed to advance gender equality. But even though many challenges remain. During the time of Covid, the shadow pandemic increased a lot. It means increasing the rate of harassment and abuse against women.

6. **Clean Water and Sanitation:** To sustain life in this universe, we need clean water, which should be accessible to all. In the world, one in three people do not have a safe water facility, two out of five people do not have a basic hand-washing facility, and more than 673 million people still practice open defecation.

7. **Affordable and Clean Energy**: It is well known that energy is the central requirement for every major challenge and opportunity. Access to electricity in poorer countries has begun to accelerate, energy efficiency continues to improve, and renewable energy has gained momentum.

8. **Decent Work and Economic Growth**: Quality jobs are a prerequisite for sustainable economic growth. As per the data of the International Labour Organisation, nearly half of the global workforce is at risk of losing their livelihood. The economic and financial shocks associated with Covid-19 increased the threat again.

9. **Industry, Innovation and Infrastructure**: To attain sustainable development, investment in infrastructure is very important and thereby innovations and industrial expansions are possible. Investment in infrastructure also plays a key role in introducing and promoting new technologies, which will enable international trade and help to use resources efficiently.

10. **Reduced Inequalities**: In order to reduce inequalities, policies must reduce inequality within and among countries.and should be helpful to the needy, disadvantaged, and marginalised people.

11. **Sustainable Cities and Communities**: It means, cities and urbanised areas should provide opportunities for all with every basic service, transportation facilities, energy use and housing.

12. **Responsible Consumption and Production**: Economic activities such as production and consumption are the driving force of development. It involves the use of natural resources, and there is a possibility of the destruction of these natural resources by the expansion of production and consumption. It means, environmental degradation is the result of large-scale production and consumption. Proper efficiency criteria are needed to protect the same.

13. **Climate Action:** All of you know that climate change will severely affect the whole universe. It is disrupting national economies and affecting lives. Estimates show that 2019 was the second warmest year on record and the end of the warmest decade (2010-19) ever recorded. Carbon dioxide levels and other greenhouse gases in the atmosphere rose to new records in 2019.

14. **Life below Water:** To attain a sustainable future, careful groundwater management is very important. The Planet Earth is capable of providing habitat to humankind, and oceans and seas played a great role. The seas are the regulating force behind the availability of rainwater, drinking water, weather, and climate, the air we breathe and even some food. However, there is a continuous deterioration of coastal water owing to pollution, and ocean acidification is having an adverse effect on the functioning of the aquatic ecosystems. Therefore, saving our oceans and seas must remain our priority.

15. **Life on Land:** Nature is essential for human survival and well-being . It provides everything to us. At the same time, anthropocentric activities altered almost 75 per cent of the Earth's surface. Around one million animal and plant species are threatened with extinction. Deforestation and desertification caused by human activities and climate change pose a major threat to sustainable development. Scientists have the opinion that, if we increase the atmospheric temperature further, the glaciers will melt fast, and so many harmful viruses may burst out and affect human health and their very existence.

16. **Peace, Justice, and Strong Institutions**: Promotion of an inclusive and peaceful society is another goal of sustainable development. If there is conflict, insecurity, poor institutions, and injustice, our developmental activities will not become sustainable.

17. **Partnership for the Goals**: All the above -mentioned goals are possible only through global cooperation and partnership. To attain sustainable development goals, coordinated plans at the global, national, regional, and local levels are required.

In short, strong international cooperation is needed to ensure the attainment of sustainable development goals even after this pandemic situation.

Recap

- The concept of sustainable development was developed by the World Commission on Environment and Sustainable Development, commonly known as the Brundtland Commission in 1987
- Sustainable development can be defined as "development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs"
- Sustainable development includes three components such as social component, the economic component, and the environmental component
- The aggregate capital stock should not decline over time is the rule of sustainability. They are weak sustainability rules and strong sustainability rules
- Approaches of sustainable development include -Appraisal of the Environment, Estimation of the Environmental Impact, Natural Resource Accounting, Government Policies and Economic Outlook
- There are 17 sustainable development goals that have to be attained by 2030

Objective Questions

1. Which commission popularised the concept of sustainable development in 1987?
2. What was the title of the Brundtland Commission's 1987 report?
3. What are the three key ideas included in the definition of sustainable development?
4. What are the three main components of sustainable development?
5. Which component of sustainable development includes eradication of poverty and rapid economic growth?
6. Which component of sustainable development includes conservation of resources and resource management?

7. Which sustainability rule allows substitution between different forms of capital?

8. Which sustainability rule emphasises that natural capital cannot be substituted?

9. What system is used internationally for natural resource accounting?

10. According to the Brundtland Commission, what are the three objectives of sustainable development?

11. In which year did the United Nations adopt the Agenda for Sustainable Development?

12. How many Sustainable Development Goals (SDGs) are included in the Agenda for Sustainable Development?

13. Which global crisis reversed progress in poverty reduction and increased risks of hunger and unemployment?

Answers

1. The World Commission on Environment and Development (Brundtland Commission)
2. Our Common Future
3. Needs, Development, and Future Generations
4. Social, Economic, and Environmental components
5. Economic component
6. Environmental component
7. Weak sustainability rule
8. Strong sustainability rule
9. The United Nations System of National Accounts (SNA)
10. Economic growth, environmental protection, and social inclusion
11. 2015
12. 17
13. The Covid-19 pandemic

Assignments

1. Explain the concept and meaning of sustainable development as developed by the Brundtland Commission.
2. Examine the three major components of sustainable development.
3. Analyse the rules of sustainability and distinguish between them with suitable examples.
4. Discuss the various approaches to achieve sustainable development.
5. Examine the continuing relevance of sustainable development in the context of growing population and climate change challenges.
6. Analyse the significance of the Sustainable Development Goals (SDGs) adopted by the United Nations in 2015 as part of the 2030 Agenda.
7. Critically examine the 17 SDGs.

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UNIT 3

Sustainable Development in the Indian Context

Learning Outcomes

After completing this unit, the learner will be able to:

- identify the major environmental challenges in India
- know the concept of sustainable development in the Indian context
- get an insight into the key policies and initiatives for environmental protection and sustainability

Prerequisites

Over the past few decades, India has experienced rapid economic growth, urbanisation, and industrialisation. While these changes have improved living standards and created new opportunities, they have also placed enormous pressure on the environment. Issues like air and water pollution, deforestation, land degradation, and the overuse of natural resources are becoming more serious and widespread. These environmental challenges directly affect people's health, agricultural productivity, water availability, and the overall quality of life.

In response to these concerns, the concept of sustainable development has become a guiding principle in India's policy-making. Sustainable development means meeting the needs of the present without compromising the ability of future generations to meet their own needs. This requires a careful balance between economic growth, environmental protection, and social well-being.

India has integrated its national development strategies with the United Nations Sustainable Development Goals (SDGs), which focus on areas such as clean energy, climate action, water and sanitation, and responsible consumption. Various government missions, schemes, and legal measures are working towards ensuring a cleaner, greener, and more equitable future.

Keywords

Environment, Sustainable Development, Poverty, Food Security, Healthcare, Education, Gender Equality

Discussion

4.3.1 Environment and Sustainable Development in the Context of the Indian Scenario

India is a country known not only for its rich cultural heritage but also for its vast natural resources, including a wide variety of plants (flora), animals (fauna), minerals, and ores. It is one of the richest countries in terms of biodiversity and is home to four out of the world's 36 biodiversity hotspots. Environmental concern in India dates back to as early as 1853, with the introduction of the Shore Nuisance (Bombay and Calcutta) Act. The Shore Nuisances Act of 1853 was a British-era law introduced to control activities that obstructed navigation and public use of coastal waters near Bombay and Kolaba.It aimed to protect public interest and improve harbour navigation for trade. However, modern environmentalism in India gained strength during the late 1970s, especially with the Chipko Movement, where local rural people, particularly women, protested against deforestation.

A major turning point came in 1972 after the Stockholm Conference, which led to the creation of the National Committee on Environmental Planning and Coordination (NCEPC). This committee was responsible for reviewing government policies and programmes related to the environment. In the same decade, the Water (Prevention and Control of Pollution) Act, 1974, was enacted to prevent pollution of water resources. This Act also established Pollution Control Boards at both the central and state levels with technical expertise and legal powers. To support the functioning of these Boards financially, the Water Cess Act, 1977, was passed, which required industries to pay a cess (a form of tax) based on their water usage.

Further progress was made in 1980 with the formation of the Department of Environment (DoE) under the Central Government. To address air pollution, the Air (Prevention and Control of Pollution) Act was passed in 1981. In 1985, the DoE was upgraded to a full Ministry of Environment and Forests, giving it more authority and importance. A major step toward sustainable development came with the enactment of the Environment (Protection) Act, 1986, often called the 'Umbrella Act'. This law had a wider scope than earlier laws, as it focused not only on water and air but also on land and the interactions between human beings and other living creatures.

Just before the Rio Conference in 1992, India announced two important policy statements. They are the National Conservation Strategy and Policy Statement on Environment and Development (June 1992) and the Policy Statement for Abatement of Pollution (February 1992). These reflected India's commitment to sustainable

development, where economic growth is balanced with environmental protection. To handle environmental disasters like the Bhopal Gas Tragedy (BGT) more effectively and to ensure quick relief and compensation, the government introduced the National Environment Tribunals Bill in 1992. This led to the formation of the National Environment Tribunal (NET) in 1995 to deal with such cases efficiently.

Alongside national policies, India also plays an active role in global environmental cooperation. It is a signatory to many Multilateral Environmental Agreements (MEAs) and international conventions. The government body responsible for international collaboration in environmental matters, earlier known as the International Cooperation Division, has now been renamed the International Cooperation and Sustainable Development Division (IC&SD) under the Ministry of Environment, Forest and Climate Change (MoEFCC). This division not only manages international relations in the field of environment but also coordinates various sustainable development activities across the country.

India's IC&SD Division works closely with several global and regional organisations such as the United Nations Environment Programme (UNEP) in Nairobi, the South Asia Cooperative Environment Programme (SACEP) in Colombo, and the United Nations Development Programme (UNDP) through its Environment Support Programme. It also engages with bodies like the Global Environment Facility (GEF), Economic and Social Commission for Asia and the Pacific (ESCAP), South Asian Association for Regional Cooperation (SAARC), European Union (EU), and the India-Canada Environment Facility, which is helping India to maintain strong partnerships in environmental governance.

To measure and promote progress in sustainability, the government has taken initiatives such as preparing the State of Environment (SoE) Reports, which assess the current environmental conditions, and developing Sustainable Development Indicators (SDIs) that help track economic activities in relation to environmental health.

India is also the nodal agency for implementing global environmental agreements such as the Convention on Biological Diversity, Kyoto Protocol, UN Framework Convention on Climate Change (UNFCCC), and the Stockholm Convention on Persistent Organic Pollutants, among others. These international agreements focus on issues like climate change, protection of endangered species, conservation of wetlands, and control over hazardous waste and pollutants.

Recognising the importance of renewable and non-renewable resources, India has also established a separate Ministry of New and Renewable Energy (MNRE). This ministry promotes the sustainable use of renewable resources like solar, wind, and hydropower while encouraging efficient use of non-renewable resources such as fossil fuels. As per recent data, India aims to achieve 500 GW of non-fossil fuel-based capacity by 2030, aligning with its Nationally Determined Contributions (NDCs) under the Paris Agreement.

India's efforts in environmental protection and sustainable development reflect a balanced approach-one that integrates economic planning with ecological responsibility, both at the national and international levels.

4.3.1.1 India's Approach to Achieving the Sustainable Development Goals

India, being the most populous country in the world, has a big responsibility in helping to achieve the Sustainable Development Goals (SDGs), set by the United Nations to promote economic growth, social inclusion, and environmental protection by 2030. Understanding this responsibility, the Government of India has integrated its national policies with the 2030 Agenda for Sustainable Development. The Indian motto 'SabkaSaath, SabkaVikas' (Together with all, Development for all) reflects the SDG principle of Leaving No One Behind (LNOB), showing a commitment to inclusive and sustainable growth.

To achieve these goals, India has involved different institutions like NITI Aayog, State governments, and other development partners. These stakeholders ensure that the SDGs are not treated as separate targets but are included in everyday policy-making. This approach is supported by the universal and normative appeal of the SDGs, which makes them suitable for all countries and societies. India uses strategies like institutional ownership, collaborative competition among states, capacity development, and a whole-of-society approach to implement the SDGs effectively.

India's federal structure, which gives powers and responsibilities to both the central and state governments, plays a key role in SDG implementation. State governments are especially important because many of the SDG-related areas, like education, health, and agriculture, fall under their jurisdiction.

To push SDG progress forward, India has introduced many schemes and programmes. These include Central Sector Schemes that are completely funded by the central government and focus on key areas like healthcare, education, and social protection. There are also Centrally Sponsored Schemes, where both the central and state governments share funding, and these are aimed at agriculture, rural development, and infrastructure. Additionally, State Government schemes are designed to address local needs and challenges. Together, these strategies help in poverty alleviation, improve health outcomes, increase educational attainment, promote gender equality, and support environmental sustainability.

A major focus in India's SDG journey is on gender equality and women's empowerment, which are essential for economic and social development. The government has also emphasised SDG localisation, i.e., applying the global goals at local levels to suit India's vast and diverse regions. One important initiative in this area is NITI Aayog's Aspirational Districts and Blocks Programme, which aims to improve governance and service delivery in the least-developed regions. This programme brings together various existing schemes, sets clear outcome-based goals, and tracks progress regularly. This helps to reduce development gaps and create positive effects across many SDG targets at once.

India's experience in implementing the SDGs has also been inspiring for other countries. Large-scale digital and social programmes like India Stack, CoWIN, and the Self-Help Group (SHG) movement have shown how India can achieve important economic and social milestones. These initiatives highlight India's potential to lead

through South-South Cooperation, where developing countries share their knowledge and work together for mutual growth.

4.3.1.2 Achieving the Sustainable Development Goals: Government Initiatives and Impact

The Government of India has actively integrated its national development policies with the Sustainable Development Goals (SDGs) outlined in the 2030 Agenda. Building on the learners' prior understanding of the 17 SDGs covered in the previous unit, this section examines how various government schemes and initiatives target critical areas such as poverty reduction, food security, healthcare, education, gender equality, and environmental sustainability. Together, these efforts form the backbone of India's socio-economic transformation.

To eliminate poverty (Goal 1), the government has introduced financial inclusion schemes like the Pradhan Mantri Jan Dhan Yojana (PMJDY) and social security programmes such as Pradhan Mantri Jeevan Jyoti Bima Yojana (PMJJBY), Atal Pension Yojana (APY), and the National Social Assistance Programme (NSAP). Employment schemes like the Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) provide wage-based rural employment, while livelihood missions such as Deendayal Antyodaya Yojana-National Rural Livelihoods Mission (DAY-NRLM) and Deendayal Antyodaya Yojana-National Urban Livelihoods Mission (DAY-NULM) promote self-employment and entrepreneurship. Similarly, the Pradhan Mantri Awas Yojana (PMAY) and DeenDayal Upadhyaya Grameen Kaushalya Yojana (DDU-GKY) support housing and skill development for the poor.

For ensuring food security and improved nutrition (Goal 2), schemes like the Pradhan Mantri Garib Kalyan Anna Yojana (PMGKAY) distribute free food grains under the National Food Security Act (NFSA). Farmers receive income support through Pradhan Mantri Kisan Samman Nidhi (PM-KISAN), crop insurance under Pradhan Mantri Fasal Bima Yojana (PMFBY), and credit via the Kisan Credit Card (KCC). Initiatives like the National Mission on Sustainable Agriculture (NMSA) and the Soil Health Card Scheme aim to improve agricultural productivity and sustainability.

Healthcare access and quality have improved under Goal 3 through schemes like Ayushman Bharat - Pradhan Mantri Jan Arogya Yojana (AB-PMJAY), which offers health insurance to low-income groups. Maternal and child health are addressed through Janani Suraksha Yojana (JSY), Pradhan Mantri Surakshit Matritva Abhiyan (PMSMA), and POSHAN Abhiyan (Prime Minister's Overarching Scheme for Holistic Nutrition). Public health infrastructure is being strengthened with initiatives like Pradhan Mantri Swasthya Suraksha Yojana (PMSSY) and Mission Indradhanush 5.0 for immunisation.

In education (Goal 4), the Samagra Shiksha Abhiyan supports school-level education, while Pradhan Mantri Uchchatar Shiksha Abhiyan (PM-USHA) enhances higher education. Financial support is provided through scholarships for Scheduled Caste (SC) students and literacy programmes. Mid-day meals, now under Pradhan Mantri Poshan Shakti Nirman (PM POSHAN), ensure school children's nutrition. The Skill Strengthening for Industrial Value Enhancement (STRIVE) and Rashtriya Avishkar Abhiyan (RAA) initiatives promote vocational skills and scientific awareness.

For gender equality (Goal 5), schemes like Beti Bachao Beti Padhao (BBBP), Sukanya Samriddhi Yojana (SSY), and the Pragati Scholarship empower girls through education and financial support. Women entrepreneurs are aided by the Micro Units Development and Refinance Agency (MUDRA) loans, while the One-Stop Centre (OSC) and Women Helpline Scheme (WHS) ensure protection and welfare.

Clean water and sanitation (Goal 6) are promoted through the Swachh Bharat Mission (SBM) and Jal Jeevan Mission (JJM), providing sanitation infrastructure and rural tap water. Water conservation is boosted via AtalBhujalYojana (AtalJal) and Jal Shakti Abhiyan (JSA).

To ensure clean and affordable energy (Goal 7), the Pradhan Mantri Ujjwala Yojana (PMUY) provides liquefied petroleum gas (LPG) connections, and the Pradhan Mantri Sahaj Bijli Har Ghar Yojana – Saubhagya (SAUBHAGYA) ensures electricity access. Solar energy is promoted through the Pradhan Mantri Kisan Urja Surakshaevam Utthaan Mahabhiyan (PM-KUSUM) and Rooftop Solar schemes, while the National Green Hydrogen Mission and Faster Adoption and Manufacturing of Hybrid and Electric Vehicles (FAME) encourage clean transportation.

Under Goal 8, India promotes decent work and economic growth through the Production Linked Incentive (PLI) Scheme, Prime Minister's Employment Generation Programme (PMEGP), and Skill India Mission. Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and the National Skill Development Mission (NSDM) improve employability. Financial assistance to entrepreneurs is provided through MUDRA Yojana, and Udyami Bharat supports small businesses.

Infrastructure development and industrial growth (Goal 9) are supported by initiatives like Digital India, PM GatiShakti (National Master Plan for Multi-modal Connectivity), and Bharatmala Pariyojana. Industrial corridors, logistics infrastructure, and schemes like PM Mega Integrated Textile Region and Apparel (PM MITRA) boost regional and manufacturing development. Start-up India and Make in India improve entrepreneurship and ease of doing business.

Reducing inequalities (Goal 10), India implements targeted programmes for Scheduled Castes (SCs), Scheduled Tribes (STs), minorities, and economically weaker sections. The Aspirational Districts Programme and Pradhan Mantri Vishwakarma Scheme aim to develop underserved regions and traditional workers.

For sustainable cities (Goal 11), missions like Smart Cities Mission, Atal Mission for Rejuvenation and Urban Transformation (AMRUT), and Pradhan Mantri Awas Yojana - Urban (PMAY-U) aim at better urban living through housing, sanitation, and public transport. Urban livelihoods are supported through the PM Street Vendor's Atma Nirbhar Nidhi (PM SVANIDHI) and National Urban Livelihoods Mission (NULM).

Responsible consumption and production (Goal 12) are supported through the Lifestyle for Environment (LiFE) initiative and schemes promoting renewable energy like PM-KUSUM and biofuel policies. The National Clean Energy Fund (NCEF) and Renewable Energy Investors' Meet and Expo (RE-INVEST) encourage sustainable investment.

Addressing climate change (Goal 13), India implements the National Action Plan on Climate Change (NAPCC) and missions promoting clean air, renewable energy, and afforestation. The Compensatory Afforestation Management and Planning Authority (CAMPA) and the National Solar Mission reduce environmental degradation and promote clean energy.

For marine conservation (Goal 14), initiatives like the Neel Kranti Mission and Pradhan Mantri Matsya Sampada Yojana (PMMSY) improve fisheries and aquatic resource management. Projects like Sagarmala and Mangrove Initiative for Shoreline Habitats and Tangible Incomes (MISHTI) support coastal development and livelihood.

Goal 15 focuses on land sustainability. Afforestation and biodiversity protection are done through Project Tiger, Project Elephant, and Nagar Van Yojana. Policies combat desertification and promote agroforestry.

Peace, justice, and strong institutions (Goal 16) are promoted through initiatives like Pro-Active Governance And Timely Implementation (PRAGATI), Right to Information (RTI), and Integrated Child Protection Scheme (ICPS). Police reforms and local governance schemes like Rashtriya Gram Swaraj Abhiyan (RGSA) ensure transparency, justice, and child protection.

For global partnerships (Goal 17), India collaborates internationally through the Group of Twenty (G20), Brazil, Russia, India, China, and South Africa (BRICS), and trade agreements, strengthening economic diplomacy and development cooperation.

India's transformation has been significant. From 2015 to 2023, 135 million people moved out of multidimensional poverty. Food security was ensured for 800 million people via the Public Distribution System (PDS) and One Nation One Ration Card (ONORC) systems. Housing and sanitation improved with the construction of 40 million homes and 119.2 million toilets. Ayushman Bharat provided health coverage to 300 million people, and education reforms reached over 156 million students.

Economically, 140 million jobs were created under MGNREGS, while the MUDRA Yojana disbursed ₹22.5 trillion to 430 million micro-entrepreneurs, including 300 million women. Infrastructure saw massive growth, with highway construction, metro networks, and digitalisation making India a leading digital economy.

Environmentally, India reduced emissions intensity by 33% and achieved its climate goals ahead of time. Renewable energy capacity reached 100 gigawatts (GW), with a sharp rise in solar energy. These achievements reflect India's commitment to inclusive, sustainable, and resilient development.

4.3.1.3 India's Sustainable Development Goals: Achievements and Challenges

India is ranked 109th out of 166 countries in the Sustainable Development Report 2024, with an SDG index score of 63.99, which shows the percentage of progress made toward achieving all 17 Sustainable Development Goals (SDGs). A perfect score of 100 would mean that a country has achieved all its goals. India falls in the yellow zone,

which means it has made progress but still faces significant challenges. In comparison, top-performing countries like Finland, Sweden, and Denmark have scores above 85, while countries like South Sudan and Yemen are at the bottom of the index with scores below 50.

Despite its current global rank, India has shown consistent improvement at the national level. Its overall SDG score increased from 66 in 2020-21 to 71 in 2023-24, reflecting better performance in key areas. Notable progress has been made in Goal 1 (No Poverty), Goal 8 (Decent Work and Economic Growth), and Goal 13 (Climate Action). Goal 13 showed the biggest improvement, rising from 54 to 67. This shows India's growing commitment to environmental sustainability and economic development.

India has also advanced in other goals such as Goal 3 (Good Health and Well-being), Goal 6 (Clean Water and Sanitation), Goal 7 (Affordable and Clean Energy), and Goal 11 (Sustainable Cities and Communities). Many goals, including Goal 10 (Reduced Inequalities) and Goal 15 (Life on Land), have scores between 65 and 99. However, some areas need more attention. Goal 2 (Zero Hunger), Goal 4 (Quality Education), and Goal 9 (Industry, Innovation, and Infrastructure) have lower scores between 50 and 64. Goal 5 (Gender Equality) is of special concern, with a score below 50. In fact, 14 states and union territories fall under the 'aspirant' category for this goal, i.e., they are still in the early stages of progress.

Government schemes focusing on food and nutrition security, healthcare, education, housing for all, sanitation, electrification, and access to clean cooking fuel have played a major role in improving these indicators. However, several socio-economic challenges remain. India needs to focus on skill development, employment generation, and income growth to reduce economic disparities. The labour force participation rate of women remains low and needs to be improved to ensure inclusive growth.

By 2030, around 590 million people are expected to live in urban and developed rural areas, with a large share being senior citizens. Therefore, promoting balanced regional development and identifying future growth centres will help to reduce social and spatial inequalities. New challenges such as non-communicable diseases, air and water pollution, and waste management also need urgent policy attention. Moreover, the availability of high-quality data is essential for effective policy design, financing, monitoring, and evaluation, ensuring timely and informed decision-making.

While India has made steady progress toward the SDGs, further efforts are needed to ensure sustainable and inclusive development for all.

Recap

- India is rich in biodiversity, hosting four global biodiversity hotspots
- Early environmental laws like the Shore Nuisance Act (1853) laid the foundation for modern policies
- The Chipko Movement (1970s) highlighted grassroots environmental activism
- Key laws include the Water Act (1974), Air Act (1981), and Environment Protection Act (1986)
- India aligns with global sustainability goals through MEAs and the IC&SD Division
- Renewable energy targets (500 GW by 2030) support climate commitments
- SDGs are integrated into national policies via NITI Aayog and state-level programmes
- Poverty reduction schemes like PMJDY and MGNREGS address Goal 1
- Healthcare (Ayushman Bharat) and education (Samagra Shiksha) improve Goals 3 and 4
- Gender equality (Goal 5) remains a challenge, with low female labour participation
- India ranks 109th in the SDG Index 2024, but shows progress in climate action and poverty reduction
- Challenges include urbanisation, pollution, and data gaps for policy monitoring

Objective Questions

1. Which movement in India emphasised grassroots environmental protection?
2. Name India's umbrella legislation for environmental protection.

3. Which ministry oversees India's renewable energy targets?
4. What is India's rank in the 2024 SDG Index?
5. Which scheme provides health insurance to low-income groups?
6. Name India's policy for rural employment guarantee.
7. Which SDG has India shown the most improvement in (2020–24)?
8. What is the target for India's non-fossil fuel capacity by 2030?
9. Which initiative promotes solar energy for farmers?
10. Which goal has the lowest progress in India's SDG performance?
11. Name India's nodal agency for SDG implementation.
12. Which programme aims to improve sanitation in rural India?

Answers

1. Chipko Movement
2. Environment (Protection) Act, 1986
3. Ministry of New and Renewable Energy (MNRE)
4. 109th
5. Ayushman Bharat (AB-PMJAY)
6. Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)
7. Goal 13 (Climate Action)
8. 500 GW
9. PM-KUSUM
10. Goal 5 (Gender Equality)
11. NITI Aayog
12. Swachh Bharat Mission (SBM)

Assignments

1. Analyse the impact of the Chipko Movement on India's environmental policies.
2. Compare the roles of the Water Act (1974) and the Air Act (1981) in pollution control.
3. Evaluate India's progress in achieving Sustainable Development Goals
4. Discuss the challenges in implementing gender equality (SDG 5) in India.
5. Assess the effectiveness of NITI Aayog's Aspirational Districts Programme for SDG localisation.

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BLOCK

Demography and Development

UNIT

Basic Demographic Concepts

Learning Outcomes

After completing this unit, the learner will be able to:

- discuss key demographic indicators
- discuss the implications of age structure
- get an insight into the factors influencing fertility and mortality rates
- know the types of mortality rates

Prerequisites

In a quiet town in rural Japan, an elderly man named Hiroshi owns a small bookstore. Decades ago, his shop was always full of children eagerly picking out new storybooks and students buying textbooks for school. The streets outside were lively, filled with the sounds of children playing and families visiting the local market. But now, Hiroshi's bookstore is mostly visited by older customers looking for novels to pass the time. The school across the street, which once had hundreds of students, has shut down due to a lack of enrolment. The town itself has changed, many young people have moved away to big cities, and the number of births has declined significantly.

Now, let us look at a completely different place, Mumbai, one of India's busiest cities. Every morning, Meena, a college student, struggles to find a seat on the crowded train. The streets are packed with people rushing to work, and every corner of the city seems to be filled with movement and energy. Hospitals are welcoming thousands of newborns each day, schools are building new classrooms to accommodate more students, and construction workers are racing to keep up with the demand for housing. Unlike Hiroshi's town in Japan, Mumbai is experiencing rapid population growth, with a large number of young people shaping its future.

Why do some places have a growing number of young people, while others are filled with ageing populations? Why do birth rates and death rates differ so much between countries? These patterns are not random;they are influenced by economic conditions, healthcare systems, cultural values, and government policies.Understanding population dynamics helps us answer these questions. The number of people in a country, their ages, and how many babies are born or people pass away each year determine everything from economic growth to government policies.

Keywords

Demography, Birth Rate, Death Rate, Age Structure, Fertility, Mortality, Population Growth, Life Expectancy, Population Pyramid

Discussion

Demography, the systematic study of human population, originated with the formation of civilised societies. Over time, societies and nations recognised the necessity of maintaining proper records of the population to facilitate administration and address social and economic issues related to population growth. The practice of recording major events such as births, marriages, and deaths began at different periods in various countries for diverse reasons. In some nations, churches started keeping records of baptisms, marriages, and deaths as early as the 15th century.

The systematic study of demography gained prominence in modern times with John Graunt (1620–1674), who is considered the real founder of demographic studies. In 1662, he published *Natural and Political Observations upon the Bills of Mortality,* analysing deaths, births, migration, and family growth. He also examined the population's capacity to serve in the army and proposed that demographic studies should consider factors such as sex, religion, age, occupation, and marital status. His work laid the foundation for demography as a discipline, introducing concepts such as the relationship between fertility, mortality, and migration. Graunt observed that the male birth rate was consistently higher than the female birth rate and that urban mortality rates were higher than rural ones. He also pioneered the use of sample surveys and life tables, marking a significant advancement in demographic analysis.

The term 'demography' originates from the Greek words demos (people) and graphein (to describe or draw). While the term was casually used earlier, Achille Guillard first employed it in a scientific sense in 1855, and since then, it has gained widespread usage. Demography has been defined in multiple ways by economists, geographers, and social scientists. According to Frank Lorimer (1959), In a broad sense, demography includes both demographic analysis and population studies. Demography studies both qualitative and quantitative aspects of the population.Stanford defines demography as 'a very technical and highly mathematical study of the vital statistics of human population (especially birth, death, and migration) as well as of the characteristics of population

structure (including age, sex, and marital status) as they contribute to an understanding of population change.'

Irene Tanker stated that 'with improved data, new techniques, and measurement of the demographic transition, demography has become a science rather than literature.' The field of demography is now recognised as a systematic, statistical study of human populations, encompassing changes in size, structure, and distribution over time and space in response to birth, migration, ageing, and death.

There are different branches of demography, including:

- **Formal Demography:** A highly quantitative field focusing on the mathematical analysis of population dynamics.
- **Social Demography (Population Studies):** Examines the social, economic, and political aspects of populations and their impact on demographic changes.

A distinction is often made between formal demography and population studies. Formal Demography focuses on the measurement and analysis of population change components. It is primarily concerned with quantitative methods and mathematical modelling to forecast population growth and demographic composition. Population Studies (Social Demography) investigates the causes and consequences of population structures and changes. Social demographers analyse how social processes and structures influence demographic trends, aligning their studies with broader sociological inquiries.

Demographic studies rely on systematic calculations, such as censuses and surveys, which collect data on individuals residing in a given territory.Demography plays a crucial role in sociology and state policy formulation. The emergence of Sociology as an academic discipline was closely linked to demographic studies. In the late 18th century, two significant developments took place in Europe:

1. The formation of nation-states as the principal form of political organisation.
2. The emergence of modern statistics as a tool for governance.

As modern states expanded their functions, including public health, policing, law and order, economic policies, taxation, and urban governance, they required the systematic collection of social statistics. The practice of social statistics, which had existed earlier, gained a more structured form by the late 18thcentury. The first modern census was conducted in the United States in 1790, followed by European countries in the early 1800s. In India, the British colonial administration conducted the first census between 1867–72, and since 1881, decennial censuses have been held regularly. Post-independence, India has continued this practice, with the most recent census conducted in 2011. The Indian census is one of the largest in the world. China, although it has a larger population, also conducts regular decennial censuses, the latest being in 2020. Demographic data are essential for economic development and public welfare policies. The aggregation of individual demographic events, such as births and deaths, provides insight into broader social phenomena. For example, Emile Durkheim's study of suicide rates demonstrated that, despite individual motivations, suicide rates show patterns that

require social-level explanations.

Demography has evolved from early record-keeping practices to a complex scientific discipline that informs policy decisions and social sciences. It includes both mathematical analysis and sociological inquiry, contributing to our understanding of population dynamics and their implications for society. As demographic data collection techniques continue to improve, the field will remain integral to addressing economic development, governance, and public welfare challenges.

5.1.1 Demographic Concepts

Demography studies population dynamics through various indicators. Among the most fundamental are birth and death rates, age structure, fertility, and mortality, which help analyse population growth, economic development, and social planning.

a. Birth Rate

The birth rate, also known as natality, is a fundamental demographic indicator that measures the number of live births in a population over a specific period, typically expressed per 1,000 individuals per year. This metric is key for understanding population dynamics, planning economic development, and formulating public policies.

The crude birth rate (CBR) represents the annual number of live births per 1,000 people in a given population. It is termed 'crude' because it considers the entire population without accounting for variations in age or sex distribution. The formula for calculating the crude birth rate is:

$$CBR = \frac{Number\ of\ Live\ Births\ in\ a\ Year}{MidYear\ Population} \times 1{,}000$$

Mid-year population refers to the total number of residents within a specific geographic area, usually a country or territory, at a specific point in time, typically July 1st of a given year. Birth rates vary significantly across different regions and countries, influenced by factors such as economic development, cultural norms, healthcare access, and government policies.

As of 2025, the global birth rate is estimated at approximately 17.13 births per 1,000 people, according to World Population Prospects and World Population Review. This reflects a steady decline observed over recent decades. Countries such as Niger, with a birth rate of 44.5 per 1,000, remain among the highest globally, while countries like Japan, with a rate of 6.65 per 1,000, represent the lower end of the spectrum.

India has followed a similar downward trajectory. In 2025, the country's birth rate stands at 16.55 births per 1,000 people, showing a 1.19% drop from the previous year, as reported by World Population Review. Additionally, India's total fertility rate (TFR) has declined from 5.7 children per woman in 1950 to approximately 1.96 in 2024, reflecting the impact of expanded access to healthcare, female education, urbanisation, and family planning services.

In the state of Kerala, known for its advanced social indicators, the birth rate has

declined to 13.2 per 1,000 population as per the Sample Registration System (SRS) 2021. Furthermore, the number of live births in Kerala has decreased significantly, from around 5.5 lakh annually to 3.93 lakh in 2023, according to a report by The Hindu (January 2025). Interestingly, this has led to a rise in the maternal mortality ratio (MMR), which now stands at 19 per 100,000 live births. This increase is not due to a surge in maternal deaths, but rather the declining number of childbirths, which affects how the ratio is calculated. Fertility patterns vary widely across Indian states. While states such as Bihar and Uttar Pradesh report higher TFRs of 3.0 and 2.35, respectively, states like Goa (1.32) and Sikkim (1.05) reflect fertility well below the replacement level, based on data from the National Family Health Survey-5 (2019–21). In Kerala, the TFR is 1.8, but differences persist across communities, Muslim women have a TFR of 2.29, compared to 1.77 for Hindu women and 1.02 for Christian women, according to NFHS-5 data. The same survey shows that fertility levels decline sharply with increasing levels of education, particularly among women.India's demographic transition brings forth complex policy challenges: managing the needs of an ageing population while ensuring balanced regional growth. Kerala's experience exemplifies both the success and the demographic dilemmas associated with a sustained decline in fertility.

Several factors contribute to the variations in birth rates both globally and within India:

- Higher income levels and improved living standards often correlate with lower birth rates, as seen in many developed countries.
- Increased educational attainment, particularly among women, and greater participation in the workforce can lead to delayed marriages and childbearing, resulting in lower birth rates.
- Availability of reproductive health services and contraception enables individuals to plan their families effectively, impacting birth rates.
- Societal attitudes towards family size, marriage, and gender roles significantly influence reproductive behaviour and birth rates.

The birth rate is a major demographic indicator that offers information about population dynamics and helps in creating social, economic, and health policies. Monitoring and understanding birth rate trends, both globally and within specific contexts like India, are essential for effective planning and sustainable development.

b. Death Rate

The death rateis a statistical measure that quantifies the frequency of deaths within a specific population over a defined period, typically expressed per 1,000 individuals annually. It serves as a key indicator of a population's health status, influencing public health policies, economic planning, and social services.

The crude death rate (CDR) represents the total number of deaths per 1,000 individuals in a population within a given year. It is calculated using the formula:

$$CDR = \frac{Total\ Number\ of\ Deaths\ in\ a\ Year}{Total\ Population} \times 1000$$

It is important to note that the crude death rate does not account for age-specific mortality factors, which can significantly influence the overall mortality profile of a population.

Globally, death rates differ widely, influenced by the quality of healthcare, economic progress, demographic structure, and social conditions. According to the United Nations projections for 2020–2025, countries such as Bulgaria, Ukraine, Latvia, Lithuania, and Romania have some of the highest crude death rates in the world, ranging between 13.4 and 15.6 deaths per 1,000 people. These elevated rates are largely attributed to ageing populations, lower fertility levels, and a greater prevalence of chronic, non-communicable diseases.Conversely, countries with younger populations and better access to healthcare, such as Qatar and the United Arab Emirates, report relatively lower death rates. These lower rates often stem from improved health infrastructure and a larger proportion of working-age and young populations. However, a low death rate does not always signify improved health outcomes; it can also reflect higher birth rates that dilute the proportion of deaths within the total population.

In India, the crude death rate has shown a sharp and steady decline over the past several decades. As per the United Nations Department of Economic and Social Affairs, India's death rate was 28.16 deaths per 1,000 individuals in 1950. This declined to 13.50 by 1980, then to 8.80 in 2000, and stood at 7.31 in 2020. The current trend projects a slight increase, with the death rate expected to rise to 7.53 by 2025. This long-term reduction reflects significant improvements in public health, disease control, access to clean water, and sanitation. Furthermore, the success of nationwide vaccination campaigns and institutional healthcare interventions has contributed substantially to this improvement.

Kerala's case is particularly noteworthy within the Indian context. Despite having one of the highest death rates among Indian states, reported at 7.0 per 1,000 population in 2020, according to the Office of the Registrar General & Census Commissioner, India, Kerala continues to be a model for public health. The relatively high death rate in Kerala is not due to poor health conditions but rather a reflection of its demographic profile. The state has a significantly ageing population, high life expectancy, and a low birth rate, all of which increase the proportion of deaths relative to the total population. When compared with other Indian states, many of which still have younger populations and relatively higher birth rates, Kerala's demographic maturity places it closer to trends seen in advanced economies. For instance, states like Bihar and Uttar Pradesh, with much lower death rates than Kerala, also report higher fertility and infant mortality rates, suggesting a population structure dominated by younger cohorts and higher risks during childbirth and early childhood. In contrast, Kerala's higher life expectancy of 75 years, the highest in the country according to the Sample Registration System Abridged Life Tables 2017–21, demonstrates the effectiveness of its healthcare model despite the statistical appearance of a higher mortality rate.

Several determinants affect a country's death rate:

1. Access to and quality of medical services play a major role in reducing mortality from both infectious and chronic diseases.

2. Higher income levels often lead to better nutrition, living conditions, and healthcare access, thereby lowering death rates.

3. Diet, physical activity, smoking, and alcohol consumption significantly impact mortality rates, particularly concerning non-communicable diseases.

4. Populations with a higher proportion of elderly individuals typically show higher death rates due to age-related health issues.

5. Effective disease prevention and health promotion strategies, such as vaccination campaigns and health education, contribute to lower mortality rates.

Understanding death rates is essential for assessing public health, planning healthcare services, and implementing policies aimed at improving population well-being. By analysing mortality data, governments and organisations can identify health challenges, allocate resources efficiently, and monitor the impact of health interventions over time.

c. Age Structure

Age structure refers to the distribution of individuals across various age groups within a population at a specific point in time. It provides information about the demographic composition, highlighting the proportion of the population in different life stages, such as childhood, working age, and old age. This distribution is key for understanding societal dynamics, economic potential, and planning for future resource needs.

According to the United Nations, age is defined as "the estimated or calculated interval of time between the date of birth and the date of census, expressed in completed solar years".

Understanding the age structure of a population is key for several reasons:

- A higher proportion of working-age individuals can indicate potential economic growth, while a larger elderly population may signal increased demand for healthcare and retirement services.

- Age distribution informs the allocation of resources for education, healthcare, and social security.

- Governments can design targeted policies addressing the needs of specific age groups, such as youth employment programs or elderly care initiatives.

The global age structure, as reported in the United Nations' World Population Prospects 2024, presents key demographic trends shaping societies today. Approximately 25% of the world's population is aged 0–14, indicating a substantial base of children and early adolescents. Another 16% fall within the 15–24 age group, representing young individuals preparing to enter the workforce. The largest segment, around 40%, belongs to the 25–54 age group, considered the prime working age and a major contributor to

economic productivity. The population aged 55–64 makes up about 9%, representing those nearing retirement. Meanwhile, the elderly population, aged 65 and above, has reached nearly 10%, signifying rising life expectancy and a global trend toward ageing populations. These shifts have significant implications for economic planning, healthcare infrastructure, pension systems, and social policies.

India's demographic profile reveals a youth-driven population with immense potential for a demographic dividend. The World Bank reports that as of 2021, nearly 67% of India's population falls within the working-age group of 15–64 years. This sizeable labour force can propel the country's economic expansion, provided adequate investments are made in education, health, and employment generation. However, approximately 33% of the population consists of dependents, children under 15 and the elderly over 65, which creates a need for increased allocation of public resources for education, healthcare, and social protection.

India's age dependency ratio, a critical demographic indicator, reflects this balancing act between economic opportunity and social responsibility. While the overall dependency ratio remains moderate, the share of the elderly population is steadily growing due to improvements in life expectancy. According to the National Family Health Survey and Census estimates, India's senior population (aged 60 and above) is projected to double from about 10% in 2021 to nearly 20% by 2050. This shift will require expanded geriatric care, pension reforms, and initiatives for active ageing to ensure economic and social security for older adults.

Kerala presents a strikingly different picture compared to many other Indian states. The state has long completed the demographic transition that most of India is still navigating. As per the Sample Registration System Statistical Report 2021, Kerala has the highest proportion of elderly people in the country, with nearly 17% of its population aged 60 and above. This is significantly higher than the national average. Additionally, the median age in Kerala is nearly a decade ahead of states like Uttar Pradesh or Bihar, where fertility rates are higher and population profiles are comparatively younger.

While Kerala's achievements in education, healthcare, and life expectancy have led to this demographic maturity, they also bring new challenges. An ageing population has pushed up the state's age dependency ratio and placed pressure on its public healthcare and social support systems. The Economic Review 2023 by the Kerala State Planning Board highlights that dependency burdens in the state are increasing, particularly due to a declining youth population and a surge in elderly care needs. By contrast, states like Bihar and Madhya Pradesh still have large youth populations, suggesting the need to invest in schooling and job creation rather than elderly welfare infrastructure.

d. Fertility Rate

The Total Fertility Rate (TFR) represents the average number of children a woman isexpected to bear during her reproductive years (typically ages 15 to 49), assuming she experiences the current age-specific fertility rates throughout her lifetime.TFR is a major demographic indicator, offering insights into population growth, economic development, and social planning.A TFR of approximately 2.1 is considered the 'replacement level', where a population exactly replaces itself from one generation

to the next, without accounting for migration.TFR is calculated by summing the age-specific fertility rates (ASFRs) for all reproductive age groups.ASFR is the number of births per 1,000 women in a specific age group.The formula is:

$$TFR = \sum(ASFR_x)$$

Where $ASFR_x$denotes the age-specific fertility rate for age group x. If ASFRs are provided in five-year intervals, the sum is multiplied by five to estimate the TFR.

Fertility rates around the world vary significantly due to a combination of economic, social, and political factors. As of 2023, some countries continue to experience high fertility rates, while others are facing historically low levels. These variations have implications for population growth, labour markets, and policy planning. Several nations, particularly in Sub-Saharan Africa, still have high fertility rates. Countries such as Somalia and Chad have Total Fertility Rates (TFRs) exceeding 6 births per woman. These high fertility rates are often associated with lower access to contraception, limited female education, high child mortality rates, and cultural norms that encourage larger families. In many of these regions, children are seen as a source of economic support, especially in agricultural based economies where labour is essential. Additionally, limited healthcare infrastructure and lower life expectancy often contribute to higher birth rates as families seek to ensure that some children survive into adulthood. On the other end of the spectrum, many developed countries are facing a sharp decline in fertility rates. South Korea, for example, has seen its TFR drop from around 6 births per woman in the 1950s to less than 1 in recent years. Other countries, including Japan, Italy, and China, are also experiencing similar trends. This decline can be attributed to economic pressures, delayed marriages, lower fertility preferences, and the rising costs of childcare and education. Additionally, in many developed nations, women's increased participation in higher education and the workforce has led to lower birth rates. Governments in these countries have attempted to reverse the trend through policies such as paid parental leave, childcare subsidies, and incentives for larger families, but the impact has been limited.

The differences in fertility rates across countries are influenced by multiple factors, including economic development, healthcare access, education levels, cultural and religious beliefs, and government policies. In developed countries, better access to healthcare and family planning services allows couples to have fewer children, while in developing nations, a lack of access to contraception often leads to higher birth rates. Education, particularly for women, plays a major role, as higher literacy rates and career opportunities often lead to delayed childbirth and smaller families. Government interventions, such as child tax benefits, housing support, and parental leave policies, can also shape fertility trends.

India has experienced a steady and remarkable decline in its fertility rate over the past five decades, signalling profound demographic and social transformations. In the 1970s, the country's total fertility rate (TFR) hovered around 5.5 births per woman, reflecting the prevalence of large families, particularly in rural and agrarian contexts. According to the National Family Health Survey-5 (2019–21), this rate declined to 2.14 by 2023, nearing the replacement level of 2.1. This shift has been largely driven by increased access to education, rising female literacy, better maternal and child healthcare,

expanded family planning services, and broader socioeconomic development. However, beneath the national average lies a landscape of significant regional variation.

Southern states such as Kerala, Tamil Nadu, and Andhra Pradesh have TFRs well below the replacement level. Kerala, for instance, has a TFR of around 1.8, as documented by the Sample Registration System Statistical Report 2021. The state's consistently high female literacy rates, widespread access to public healthcare, and early adoption of family planning policies have contributed to its advanced demographic transition. Tamil Nadu and Andhra Pradesh reflect similar trends, each showing fertility rates below 2, largely attributable to sustained investments in public health and women's education. By contrast, northern and central Indian states like Bihar, Uttar Pradesh, and Madhya Pradesh continue to record higher fertility rates. According to NFHS-5, Bihar had a TFR of 3.0 and Uttar Pradesh 2.35, well above the national average. These higher rates correlate with lower female literacy, high levels of poverty, limited access to contraceptives and reproductive health services, and deeply entrenched socio-cultural norms that favour larger families. In these regions, the demographic transition is still underway, and population growth remains a pressing concern.

Kerala's demographic profile starkly contrasts with these high-fertility states. While Bihar and Uttar Pradesh are experiencing population momentum, Kerala is facing the consequences of early fertility decline. The state is now grappling with an ageing population and a shrinking base of young dependents. This trend has led to challenges such as rising old-age dependency, higher demand for geriatric care, and a slowing rate of natural population growth. Moreover, Kerala's Maternal Mortality Ratio, though still the lowest in the country at 19 per 100,000 live births, is increasing—not because more women are dying, but because the number of live births has drastically declined, with the state recording just 3.93 lakh births in 2023, compared to 5.5 lakh annually a decade ago, as per The Hindu report from January 2025.

India's overall demographic trajectory presents a mixed picture of progress and complexity. While a declining fertility rate offers economic opportunities through reduced pressure on resources, it also foreshadows long-term concerns such as labour shortages and an ageing population. For Kerala and similar states, the focus must now shift to policies that support elderly care, migration management, and workforce automation. Meanwhile, high-fertility states require continued emphasis on improving health infrastructure, increasing female education, and raising awareness of reproductive health. Strategically, India stands at a demographic crossroads. Managing its uneven fertility landscape requires nuanced, state specific policies.

Kerala offers a preview of India's demographic future, while Bihar and Uttar Pradesh remind policymakers of the work still ahead. By adopting an integrated approach that accounts for regional disparities, India can balance the demographic dividend with future sustainability.

e. Mortality Rate

Mortality rate, often referred to as the death rate, quantifies the frequency of deaths within a specified population during a defined time frame, typically expressed per 1,000 individuals annually. This serves as a major indicator of a population's overall health

status, the effectiveness of its healthcare systems, and prevailing living conditions. By analysing mortality rates, policymakers, healthcare professionals, and researchers can identify health challenges, allocate resources efficiently, and develop targeted interventions to improve public health outcomes.

The general formula to calculate the mortality rate is:

$$Mortality\ Rate = \left(\frac{Number\ of\ Deaths\ in\ a\ Given\ Time\ Period}{Total\ Population\ at\ Risk\ During\ the\ Same\ Period}\right) \times 1000$$

This calculation yields the number of deaths per 1,000 individuals in the population for the specified time period, facilitating comparisons across different regions and timeframes.

Types of Mortality Rates

a. **Crude Death Rate (CDR):** Represents the total number of deaths from all causes in a population per 1,000 individuals per year. While straightforward, CDR does not account for variations in age distribution within the population.

b. **Age-Specific Mortality Rate:** Focuses on the number of deaths within a specific age group per 1,000 individuals in that age bracket, offering information about the health challenges faced by different age demographics.

c. **Infant Mortality Rate (IMR):** Calculates the number of deaths of infants under one year of age per 1,000 live births in a given year, serving as a key indicator of maternal and child health services.

d. **Maternal Mortality Rate (MMR):** Measures the number of maternal deaths due to pregnancy-related causes per 100,000 live births, reflecting the quality of maternal healthcare services.

e. **Cause-Specific Mortality Rate:** Indicates the mortality rate from a specific cause within the population, helping in understanding the impact of particular diseases or conditions.

According to recent data from the World Bank, global mortality rates continue to show notable variation across countries and regions, largely shaped by differences in economic development, healthcare access, and public health interventions. The World Health Organisation (WHO) reports that the global crude death rate stands at approximately 7.7 deaths per 1,000 individuals annually. The leading causes of death globally include ischaemic heart disease, stroke, chronic obstructive pulmonary disease (COPD), lower respiratory infections, and Alzheimer's disease. These figures reflect the rising global burden of non-communicable diseases, particularly in ageing and urbanising populations.

India, with its large and demographically diverse population, has experienced a long-term decline in crude death rates, indicating substantial improvements in public health, sanitation, immunisation coverage, and healthcare services. Data from the World Bank reveals that India's death rate, which stood at around 28.1 per 1,000 individuals in 1950, fell to 7.31 in 2020, with projections indicating a marginal rise to 7.53 by

2025. This reduction is a testament to improved healthcare infrastructure, better disease surveillance, and increased access to medical treatment, particularly for communicable diseases. However, this decline has not been uniform across the country.

Kerala, known for its exemplary public health system, has consistently recorded a higher death rate than many other states despite having one of the best healthcare indicators in India. According to the Office of the Registrar General & Census Commissioner, India, Kerala's death rate stood at 7.0 per 1,000 people in 2020. This higher rate is not indicative of poor health outcomes but rather reflects Kerala's older population structure, as the state has advanced further along the demographic transition. In contrast, states like Bihar and Uttar Pradesh, which have younger populations, recorded lower death rates of 5.4 and 6.5, respectively, in the same year. These states also experience high fertility and population growth, which dilutes the proportion of deaths in the total population. Kerala's demographic maturity brings unique challenges. The state has the highest proportion of elderly citizens in the country, and as a result, deaths due to age-related non-communicable diseases such as heart disease, stroke, cancer, and diabetes are more common. Additionally, the burden of care for an ageing population places pressure on the healthcare system, demanding more investment in palliative and geriatric care services.

According to the Sample Registration System Statistical Report 2021, non-communicable diseases accounted for nearly 70% of total deaths in the state, far exceeding the national average.Despite these challenges, Kerala has led India in reducing maternal and infant mortality rates. The state's Maternal Mortality Ratio (MMR) is the lowest in the country at 19 per 100,000 live births, and its infant mortality rate (IMR) stands at around 6 per 1,000 live births. These figures are significantly better than national averages, India's MMR was 97 and IMR was 28 as per the latest Sample Registration System data. In contrast, states like Uttar Pradesh and Madhya Pradesh continue to struggle with high maternal and child mortality due to poor health infrastructure and low institutional delivery rates.Overall, while India has made commendable progress in reducing mortality, the emerging threat of non-communicable diseases and regional disparities in healthcare outcomes remain pressing concerns.

Kerala's experience underscores the importance of investing in preventive health, geriatric services, and health equity. At the same time, states with poorer outcomes must strengthen primary healthcare, improve health literacy, and address social determinants of health to close the gap. A state-specific, data-driven approach is crucial to ensure that the gains in mortality reduction are both sustained and inclusive across the nation.

Mortality rate is a fundamental demographic indicator that provides valuable insightinto the health and well-being of populations. Understanding its various forms and the factors influencing them is essential for developing effective public health strategies and policies. In the global context, and specifically within India, analysing mortality rates helps in identifying health priorities, allocating resources appropriately, and ultimately improving the quality of life for all individuals.

Recap

- Demography is the statistical study of population changes due to birth, death, migration, and ageing
- John Graunt is considered the founder of modern demography; he used mortality data to study population patterns
- Formal demography focuses on mathematical analysis, while population studies explore social and economic factors
- Birth rate is the number of live births per 1,000 people; it is higher in developing countries and is influenced by various factors
- Death rate measures the number of deaths per 1,000 individuals; lower in countries with better healthcare and higher incomes
- Age structure shows population distribution by age and impacts policies related to work, education, and elderly care
- Fertility rate indicates the average children per woman; TFR of 2.1 is needed for a replacement-level population
- Mortality rate includes various types like infant, maternal, and age-specific death rates and reflects health system quality

Objective Questions

1. Who is considered the founder of demography?
2. What is the ideal Total Fertility Rate for replacement level?
3. What rate measures live births per 1,000 people?
4. What is the term for deaths per 1,000 people annually?
5. Which branch of demography is highly quantitative?
6. What percentage of India's population was of working age (15–64) as of 2021?
7. Which rate measures maternal deaths per 100,000 live births?

8. What is the key demographic indicator showing children and the elderly vs. workers?

9. What does CBR stand for in demography?

Answers

1. John Graunt
2. 2.1
3. Birth rate
4. Death rate
5. Formal demography
6. 67%
7. MMR
8. Dependency ratio
9. Crude birth rate

Assignments

1. Define and explain the key demographic indicators: birth rate, death rate, fertility rate, and mortality rate.
2. Discuss the significance of age structure in demographic studies.
3. Compare and contrast fertility and mortality rates in developing and developed countries.
4. Examine the interrelationship between fertility rates and women's education and employment. How does empowering women impact demographic trends?
5. Analyse the implications of declining birth and death rates in the context of demographic transition theory. What challenges and opportunities does this pose for developing nations?

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UNIT 2

Population and Economic Development

Learning Outcomes

After completing this unit, the learner will be able to:

- discuss the relationship between population growth and economic development
- describe the benefits and cost of population growth
- know the role of human capital in economic progress
- get an insight on population related problems

Prerequisites

Nigeria is one of the fastest growing populations in the world, with a young and energetic workforce; it has the potential for great economic growth. But there is a challenge: not everyone can find a job. There are simply not enough industries, and the economy is struggling to keep up with the demands of its growing population. Without enough employment opportunities, many young people face poverty, frustration, and even social unrest.

Now, let us travel to a very different place, Germany. Unlike Nigeria, Germany is experiencing a population decline. More people are retiring than entering the workforce, and companies are struggling to find young, skilled workers. The government is even encouraging immigration to bring in more workers to sustain the economy. Decades ago, Germany was one of the most powerful economies in the world, but with fewer young workers and an ageing population, maintaining economic growth has become a challenge.

These two contrasting stories show us the strong connection between population and economic development. A growing population can be a country's biggest strength if it is supported by education, healthcare, and job opportunities. However, if population growth outpaces economic development, it can lead to serious challenges like unemployment, resource shortages, and poverty.At the

same time, an ageing population can also create problems. When a country has more elderly people than working-age citizens, it struggles to maintain economic productivity. The burden on healthcare and pension systems increases, and fewer young workers are available to support the economy.

Keywords

Human Capital, Economic Growth, Population Composition, Labour Force, Dependency Ratio, Population Policy, Development Economics, Demographic Dividend, Resource Scarcity

Discussion

5.2.1 Population and Economic Development

The relationship between population growth and economic development remains one of the most complex and debated issues in economic discussions. Population growth has been viewed both as a catalyst and as a constraint in the developmental process. The arguments surrounding this issue span centuries, reflecting differing ideological, theoretical, and empirical positions.

Ancient Greek philosophers such as Plato and Aristotle perceived population growth as undesirable. Plato proposed a fixed number of citizens, 5,040, for a state, favouring mathematical symmetry over demographic expansion. Aristotle similarly advocated for limiting population size to maintain economic and social balance.In contrast, early political economists such as Sir William Petty and Adam Smith saw population growth as a source of national wealth. Smith viewed labour as the ultimate source of value, and hence population expansion was seen as beneficial.

However, the classical economist, Thomas Robert Malthus famously warned that unchecked population growth would outstrip food production, leading to poverty and famine, a view that influenced policy and academic thinking for generations.

Malthus's theory was strongly criticised by Karl Marx and Friedrich Engels, who argued that poverty was a result of capitalist structures rather than demographic pressure. Robert McNamara, the former President of the World Bank, in the World Development Report (1984), referred to population growth as 'the most delicate and difficult issue of our era, it is controversial, emotional, and immeasurably complex.' While leaders like Mao Zedong and Prime Minister Pitt of 18thcentury Britain, celebrated population as national wealth, the Malthusian and Neo- Malthusian perspectives caution against overpopulation as a barrier to economic progress. Thus, population growth appears to act both as a stimulus and a constraint, reflecting an inherently dualistic nature.

5.2.1.1 Benefits of Population Growth

1. **Increase in Labour Force and Output:** A growing population improves the labour force, thereby contributing to economic production. Labour, when supported by capital and technology, remains an asset for economic development. Population growth can lead to increased output and productivity through expanded economic activities.

2. **Expansion of Markets:** A larger population base leads to an expanding market for goods and services. This, in turn, encourages specialisation and division of labour, and industrialisation, particularly capital-intensive industries, flourishes under conditions of large-scale production, which is made viable by a sizable domestic market.

3. **Economies of Scale:** A higher population permits the realisation of economies of scale, encouraging more efficient production and increased investment in infrastructure and innovation. Historical evidence from industrialised nations indicates that population growth was a significant driver of development during the Industrial Revolution.

4. **Human Capital and Innovation:** According to the 1984 World Development Report, people are central to growth, not just as labourers but as creators of knowledge and technology. The argument that people contribute nothing to per capita income neglects their role in innovation and productivity improvements.

5.2.1.2 Costs of Population Growth

1. **Diminishing Returns and Resource Pressure:** The Malthusian argument suggests that as population grows, pressure on finite natural resources leads to diminishing returns, especially in agriculture. However, technological progress, particularly the green revolution, has reduced such constraints in many developing countries.

2. **Savings and Capital Formation:** Coale and Hoover argued that rapid population growth negatively affects capital formation due to:

    - **Age-dependency Effect:** A higher dependency ratio diverts income from savings to consumption.

    - **Capital-shallowing Effect:** More workers with less capital reduce labour productivity.

    - **Investment-diversion Effect:** Increased spending on health and education is seen as a diversion from productive investment.

However, these views have been contested. Investments in health and education (i.e., human capital) are now recognised as essential drivers of sustainable development.

3. **Food Security Concerns:** While neo-Malthusians warn that population growth outpaces food production, leading to hunger and malnutrition, empirical data reveal a different picture. Countries like India have achieved food self-sufficiency through agricultural innovation. Economist Amartya Sen attributes hunger and famine not to food shortages but to entitlement failures and inequitable distribution of resources.

4. **Unemployment and Labour Absorption:** Rapid population growth is often blamed for rising unemployment in developing countries. However, employment levels are more closely tied to the nature of technology and structural transformation than to population size. The success of populous nations like South Korea and Taiwan undermines the direct linkage between high population growth and unemployment.Additionally, rural-to-urban migration, often interpreted as a result of Malthusian pressure, reflects structural change inherent in economic development rather than overpopulation per se.

5. **Environmental Degradation:** Neo-Malthusians argue that population pressure causes ecological damage through deforestation and land degradation. Environmental degradation results from both high consumption lifestyles in developed countries and unsustainable land use practices driven by population pressures in developing regions.

The debate on the impact of population growth on economic development reveals no clear cut answer. While certain adverse effects are real, many presumed costs are either exaggerated or context specific. Likewise, the benefits, particularly in terms of market size, labour availability, and innovation potential, cannot be ignored.Contemporary economists largely agree that population growth in itself is not the principal barrier to economic development in low-income countries. Rather, development outcomes depend on broader institutional, structural, and policy factors. The key lies in effective human capital development, equitable resource distribution, and the adoption of sustainable development strategies.

5.2.2 Human Capital

Human capital formation refers to the process through which a country cultivates and improves the capabilities and skills of its people. In a context where a large population can be perceived as a burden, investing in human capital becomes essential to transform this potential liability into a productive asset. As per Harbison, human capital formation involves “the process of acquiring and increasing the number of people who possess the skills, education, and experience that are essential for the economic and political development of a nation.” It is an investment in human beings, enabling them to become dynamic, innovative, and productive contributors to the economy. For holistic economic growth, it is imperative that countries adopt strategic manpower planning aimed at the systematic development of their human resources.

Manpower planning involves assessing and preparing the human resource base to align with the evolving needs of the economy.To ensure the effective utilisation of available human resources, it is key to provide quality education and vocational

training across a range of disciplines such as technology, engineering, management, medicine, and other fields vital for economic progress.A key aspect of human capital formation is the cultivation of advanced skills.Since the process of skill acquisition and refinement is gradual and time intensive, the broader effort of human resource development necessitates sustained and forward looking policy measures.

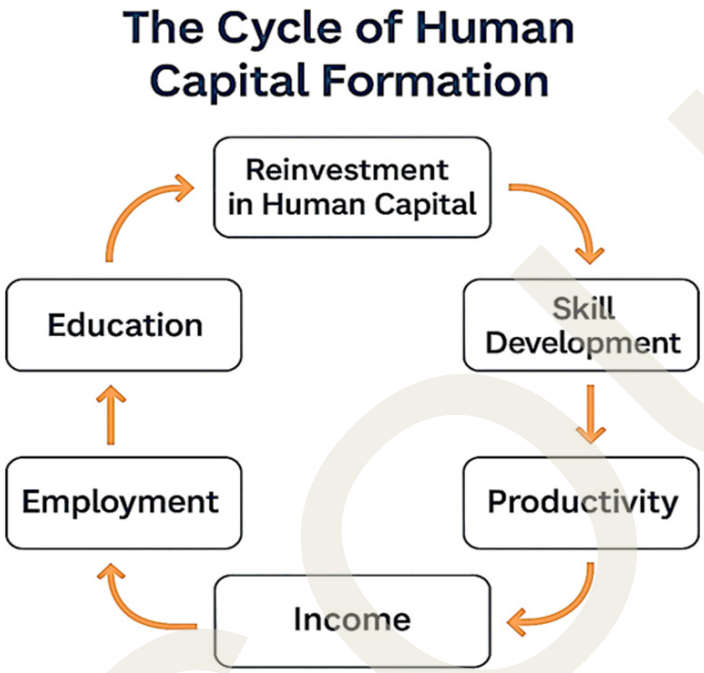

Fig. 5.2.1 The Cycle of Human Capital Formation

Simon Kuznets rightly pointed out that the most valuable asset of an advanced industrial economy is not merely its physical capital but rather its accumulated body of scientific knowledge and the competence of its people to apply that knowledge productively.Therefore, human capital formation represents a strategic investment in education, health, and vocational training aimed at equipping individuals with specialised skills. Repeating this view, Prof. Meier observed that it is "the process of acquiring and increasing the number of persons who have skills, education, and experience which are critical for the economic and political development of a country."

5.2.3 Composition of Human Capital

The composition of human capital in India is shaped by various interrelated factors:

1. **Education and Literacy:** Education is a fundamental component of human capital, directly influencing an individual's productivity and capacity for innovation. In India, literacy levels have steadily improved over the decades. According to the 2023 data from the National Statistical Office (NSO), the national literacy rate stands at approximately 77.7%. However, this average hides significant disparities across gender and regions. The literacy rate for males is 84.7%, while for females,it is just 70.3%, pointing to a persistent

gender gap. Similarly, rural areas lag behind urban centres in educational attainment. While the Gross Enrolment Ratio (GER) in higher education has reached 28.4%, many students face difficulties in completing their education due to socio-economic constraints. Additionally, the quality of education, especially in public institutions, remains inconsistent. Issues such as a lack of infrastructure, shortage of qualified teachers, and inadequate access to digital learning tools affect learning outcomes, especially in rural and tribal areas.

2. **Skill Development:** Skill development is a key aspect of human capital, bridging the gap between education and employment. India, despite its demographic advantage, struggles with a skilled workforce deficit. The Periodic Labour Force Survey (PLFS) 2023 reports that only 3.8% of the workforce has received formal vocational training, while 8.9% received informal training. This highlights a severe gap in skill preparedness. There is a mismatch between what educational institutions teach and the skills demanded by employers, leading to widespread underemployment and job dissatisfaction. The government's "Skill India Mission" aims to address this by offering short-term and long-term skill development programmes, but the scale and quality of these initiatives remain inconsistent.

3. **Health and Nutrition:** Health is another basis of human capital. A healthy population is more productive, capable of learning, and less burdened by economic and social costs. India has made notable improvements in health indicators;life expectancy has increased to 70.1 years, and infant mortality and maternal mortality rates have declined. However, malnutrition remains a pressing issue. The National Family Health Survey-5 (2019–21) reveals that 35.5% of children under five are stunted, and 32.1% are underweight. Despite the implementation of large-scale health schemes like Ayushman Bharat, access to quality healthcare remains uneven. Many rural and economically backward regions lack essential medical facilities, trained personnel, and basic infrastructure, which impede health outcomes. Public spending on health, standing at just 2.1% of GDP as of 2023–24, is insufficient given the country's vast and growing population.

4. **Technological Capability and Digital Literacy:** With the increasing digitalisation of education and work, technological literacy has become a major component of human capital. The COVID-19 pandemic revealed the digital divide in India. Online learning became the norm, but millions of students, particularly in rural India, lacked access to devices and reliable internet. The NFHS-5 data indicate that only 41% of women and 62% of men in rural India have mobile phones with internet access. This digital divide, compounded by gender and region, further deepens inequalities in human capital development and access to economic opportunities.

5.2.4 Problems and Challenges in Human Capital

The problems and challenges in human capital are as follows:

1. **Educational Inequalities:** One of the major challenges is the uneven quality of education across different socio-economic and geographic segments.

While private urban schools often provide high-quality education, most public schools in rural areas suffer from a lack of basic infrastructure, poorly trained teachers, and outdated pedagogy. Furthermore, the dropout rate, particularly among girls, remains high due to poverty, domestic responsibilities, and socio-cultural factors such as early marriage. This limits the participation of a significant section of the population in the workforce and hinders economic mobility.

2. **Skill Mismatch and Youth Unemployment:** Another critical issue is the mismatch between the skills that are being imparted and the requirements of the job market. Many graduates are not equipped with the technical or soft skills needed for modern jobs, resulting in high levels of educated unemployment. According to data from the Centre for Monitoring Indian Economy (CMIE), the unemployment rate among graduates was as high as 42.3% in 2023. This indicates a structural problem in the education-to-employment pipeline, undermining the productive capacity of a large segment of the working-age population.

3. **Gender Disparities:** Gender inequality is deeply embedded in the Indian labour market and education system. Although there has been progress in female literacy and enrolment, participation in the workforce remains worryingly low. According to the Periodic Labour Force Survey (PLFS) 2022-23, released by the Ministry of Statistics and Programme Implementation, the Female Labour Force Participation Rate (FLFPR)in India improved to 37% in 2023. Multiple barriers, including a lack of safety, social norms, and limited childcare options, restrict women's economic engagement. Even when women are employed, they are more likely to be found in low-paid, informal, and insecure jobs.

4. **Health Inequities:** Despite policy efforts, health disparities continue to obstruct human capital development. Malnutrition, anaemia, and limited access to quality maternal healthcare persist among low-income and marginalised populations. Poor health in early years adversely affects cognitive development and school performance, leading to a lifelong disadvantage. Moreover, health expenditure is largely out-of-pocket, pushing many families into poverty when illness strikes, which in turn affects their ability to invest in human capital.

5. **Informal Sector Dominance:** India's labour market is dominated by informal employment, with over 90% of workers in unorganised sectors. These workers often lack formal contracts, job security, social protection, and access to upskilling opportunities. This not only reduces overall productivity but also creates a vicious cycle of low-income, poor health, and inadequate access to education.

6. **Regional Imbalances:** Human capital indicators vary significantly across Indian states. Southern states like Kerala and Tamil Nadu have higher literacy rates, better health infrastructure, and more skilled workers. In contrast, states like Bihar, Jharkhand, and Uttar Pradesh lag behind in most metrics. These regional disparities reinforce economic inequalities and hinder the achievement of balanced national development.

7. **Brain Drain:** India also faces the problem of brain drain, where highly educated and skilled professionals migrate abroad in search of better education and employment opportunities. In 2022 alone, over 225,000 Indian students went abroad for higher studies. While remittances from the diaspora benefit the economy, the outflow of talent weakens the domestic innovation ecosystem and reduces the availability of skilled professionals for key sectors.

5.2.4.1 Government Initiatives and Policy Measures

Recognising these challenges, the Indian government has launched several initiatives aimed at strengthening human capital.

- The National Education Policy (NEP) 2020 is a landmark reform that aims to make education more holistic, multidisciplinary, and skills-oriented. It focuses on early childhood care, mother tongue instruction, vocational education, and flexible curricula to improve learning outcomes.

- The Skill India Mission was launched in 2015 with the target of training 400 million individuals by 2022. As of 2024, the programme continues with revised implementation phases. Programmes like the Pradhan Mantri Kaushal Vikas Yojana (PMKVY) and the National Apprenticeship Promotion Scheme (NAPS) provide short-term training and encourage industry-led skill development.

- The Ayushman Bharat programme seeks to improve health infrastructure and provide free health coverage to over 500 million people. It also includes Health and Wellness Centres (HWCs) to deliver primary healthcare.

- The Digital India programme focuses on expanding internet access, digital infrastructure, and digital literacy. It plays a key role in bridging the urban-rural and gender digital divide and improving access to education and employment services.

Human capital is the foundation of a country's economic and social advancement. For a country like India, which holds the world's largest youth population, investing in education, healthcare, skill development, and digital inclusion is not just desirable but critical. While progress has been made in various areas, the challenges of inequality, unemployment, and systemic inefficiencies continue to hinder optimal human capital development. A multidimensional and inclusive approach, incorporating government, private sector, and civil society, is necessary to unlock the full potential of India's human resources and convert its demographic dividend into long-term development gains.

Recap

- Population growth can both support and hinder economic development, depending on context and resources
- Malthus warned that unchecked population growth would outpace food production, leading to poverty
- Marx argued that poverty is caused by capitalism, not population growth
- A high population can increase labour supply, expand markets, and support economies of scale
- Overpopulation may reduce per capita income, savings, and capital formation
- Technological progress and education can mitigate the negative impacts of population growth
- Human capital includes education, skills, health, and productivity of a population
- India faces issues like skill mismatch, poor public health, low female workforce participation, and educational inequality
- Government initiatives like NEP 2020, Skill India, Ayushman Bharat, and Digital India aim to improve human capital

Objective Questions

1. Who warned that the population would grow faster than the food supply?
2. What is the process of improving people's skills and education called?
3. Which programme trains Indian youth in market relevant skills?
4. What concept refers to the economic advantage of a large youthful population?
5. Which Indian policy focuses on holistic, skill-based education reform?
6. Who said people are central to economic growth, not just labourers?

7. What is the term for a mismatch between education and job requirements?
8. Which economist is associated with labour as a source of value?
9. What is the major issue when savings decline due to population increase?
10. What is the key problem caused by population exceeding job creation?

Answers

1. Malthus
2. Human capital formation
3. Skill India
4. Demographic dividend
5. NEP 2020
6. World Bank
7. Skill mismatch
8. Adam Smith
9. Capital formation
10. Unemployment

Assignments

1. What is the relationship between population growth and economic development?
2. Define human capital. How does investment in human capital influence economic development?
3. Explain the economic significance of population composition with respect to age, gender, and literacy.
4. What are the major population-related challenges faced by developing economies?

5. Discuss the concept of demographic dividend. How can it be utilised to promote sustainable economic development?

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UNIT 3

Theories of Population Growth

Learning Outcomes

After completing this unit, the learner will be able to:

- describe the optimum theory of population
- know the superiority of Malthusian theory
- discuss the stages of the demographic transition theory
- comprehend the implications of the demographic transition on economic development

Prerequisites

A few centuries ago, a British economist named Thomas Malthus looked at the world and made a frightening prediction. He believed that population growth would soon outpace food production, leading to widespread famine, disease, and poverty. According to him, if people kept having more children, there would not be enough resources for everyone. This idea, known as the Malthusian Theory, influenced many governments and policymakers, who feared the consequences of overpopulation. Some countries even introduced strict population control measures based on these fears. However, as time passed, Malthus's predictions did not fully come true. While some countries did struggle with high population growth, others found ways to increase food production and improve living conditions. Advances in agriculture, technology, and education helped societies grow without falling into the crisis Malthus had predicted.This led to a new understanding of population change, the Theory of Demographic Transition.

A good example of this transition is seen in countries like South Korea and Japan. In the past, these countries had high birth rates and rapid population growth. But as they became more industrialised and urbanised, families started having fewer children. Today, both countries face a new challenge: too few births to replace the ageing population.On the other hand, many developing nations are still in the early stages of demographic transition, experiencing rapid

population growth. In countries like India and Brazil, governments are working to balance population growth with economic development, ensuring that their growing populations have enough jobs, resources, and opportunities. Theories of population change provide insights into the ways in which societies evolve over time. Some theories warn about the dangers of overpopulation, while others highlight how populations naturally adjust based on economic progress.

Keywords

Optimum Population, Demographic Transition, Population Growth, Malthusian Theory, Overpopulation, Under population, Economic Sustainability, Fertility

Discussion

5.3.1 Optimum Theory of Population

The Optimum Theory of Population marks a significant departure from the traditional Malthusian approach by focusing on the relationship between population size and economic welfare rather than on food supply. This theory aligns closely with modern economic principles by relating demographic variables with economic performance, especially the maximisation of per capita income. Proposed by Edwin Cannan in his seminal work Wealth (1924) and later developed and popularised by economists such as Lionel Robbins, Hugh Dalton, and Carr Saunders of the London School of Economics, the theory presents a more realistic and clear understanding of population dynamics.

The Optimum Population is defined as that ideal size of population which, given the available natural resources, capital stock, and technology, maximises per capita income. This optimum is not merely a numerical target but an economic ideal where the balance between population and resources yields the greatest welfare. In simple terms, if a country has fewer people than the optimum level, it is under populated, and its resources are underutilised. Conversely, if the population exceeds the optimum level, the country is over populated, leading to a decline in income per head due to pressure on resources and the operation of the law of diminishing returns.

Assumptions of the Optimum Theory

The theory operates under several assumptions:

- The stock of capital and natural resources is fixed.
- Technology remains constant.
- Full employment of resources is ensured.
- Per capita income is a valid indicator of economic welfare.

These assumptions simplify the analysis but also limit the applicability of the theory in dynamic economic conditions.

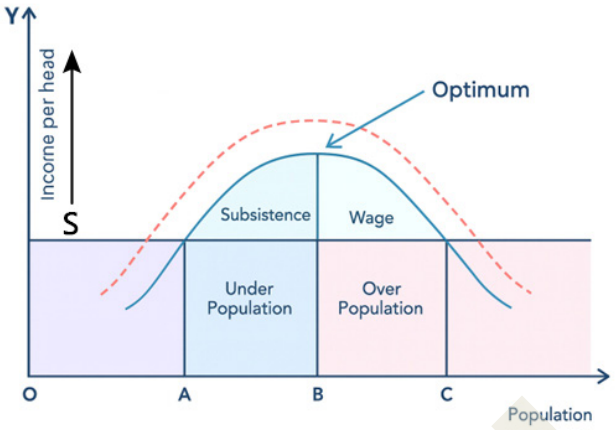

Fig. 5.3.1 Optimum Theory of Population

In the traditional diagrammatic representation, the X-axis represents the size of the population and the Y-axis measures per capita income.Initially, as the population increases, per capita income also rises due to more efficient utilisation of resources. This continues until a point N (the optimum population), at which income per head reaches a maximum M. Any further increase in population beyond this point reduces per capita income, indicating over-population.

In the diagram, population size is represented along the X-axis, and income per capita along the Y-axis.

- OS indicates the subsistence level of income, the minimum income necessary to sustain life.
- OA reflects a population size too small to efficiently utilise resources, leading to subsistence income.
- OC depicts a population too large, where overexploitation of resources reduces per capita income to the subsistence level.
- The point OB denotes the optimum population at which the income per capita is maximised.

When the population is below OB, increases in population lead to a rise in per capita income. Beyond OB, any further population growth results in declining per capita income, unless preventive measures are adopted.An upward shift in the income curve (illustrated by a dotted line) can occur due to technological advancements or trade expansion. Such changes increase the productivity of the population, allowing a higher equilibrium population while maintaining or increasing per capita income.

Dalton introduced a formula to quantify maladjustment from the optimum population level:

$$M = \frac{A - O}{O}$$

Where:

- M is the measure of maladjustment.
- A is the actual population.
- O is the optimum population.
- If M > 0, the country is overpopulated.
- If M < 0, the country is under populated.
- If M = 0, the country is at its optimum level.

However, since the value of O cannot be precisely measured in real world scenarios, the formula remains of academic interest only.Dalton introduced a theoretical formula to assess deviation from the optimum population. However, due to difficulties in estimating the optimum population, it holds more academic than practical value.

Superiority over Malthusian Theory

The Optimum Theory of Population holds several advantages over the Malthusian theory:

1. **Economic Context:** While Malthusian theory provides a general principle applicable irrespective of economic conditions, the optimum theory evaluates population in relation to a country's specific economic context.

2. **Focus on Welfare:** It replaces the food-population linkage of Malthus with a focus on wealth and income generation, thus expanding the scope of analysis.

3. **Dynamic Perspective:** The optimum theory allows for the possibility of changes in the optimum level itself with technological progress, capital accumulation, or resource discovery.

Criticisms of the Theory

Despite its theoretical appeal, the Optimum Theory of Population has several significant limitations:

1. **Lack of Empirical Basis:** There is no empirical evidence to precisely determine the optimum population level in any country, rendering the concept speculative.

2. **Vagueness:** The theory is qualitative as well as quantitative, involving not just numbers but also the quality, age structure, and productivity of the population. These factors are dynamic and environment-dependent.

3. **Measurement Issues:** Reliable data on per capita income is often unavailable or imprecise, making it difficult to validate the optimum condition in practice.

4. **Static Assumptions:** By assuming fixed capital and technology, the theory fails to accommodate economic growth, innovation, and structural changes, which are critical to modern development discourse.

5. **Limited Practical Utility:** As noted by Prof. Hicks, the theory is "a notion of extremely little practical interest," and Prof. Beveridge dismissed it as "a speculative construction not entitled to a place in the corpus of theoretical economics."

Although the Optimum Theory of Population may not offer a concrete policy framework, its value remains significant. It encourages policymakers to consider the productive utilisation of human resources and the need for balance between population growth and economic capacity.The Optimum Theory of Population, while theoretically superior to Malthusian pessimism, suffers from empirical and practical limitations. Nevertheless, its core message, that population growth must align with the productive capacity of the economy to maximise welfare, remains relevant. It shifts the population debate from mere survival to economic efficiency and well-being, providing a more holistic framework for analysing demographic issues.

5.3.2 Theory of Demographic Transition

The Theory of Demographic Transition explains the transformation of countries from having high birth and death rates to low birth and death rates as part of the economic development process. This theory establishes a correlation between population growth and economic development and outlines the stages through which societies progress demographically. According to E.G. Dolan, "Demographic transition refers to a population cycle that begins with a fall in the death rate, continues with a phase of rapid population growth and concludes with a decline in the birth rate." The theory is grounded in historical demographic changes observed in Europe and other parts of the world, suggesting that all countries pass through four or five stages of demographic evolution as they develop.

Stages of Demographic Transition

Stage I: High Fluctuating Stage (Pre-Transition)

In the first stage, referred to as the high fluctuating stage, both birth and death rates are extremely high. The death rate is elevated due to the absence of proper medical facilities, poor sanitation, frequent famines, and the prevalence of epidemics. Birth rates, on the other hand, remain high owing to early marriages, lack of family planning, religious beliefs, and economic reliance on children as a source of labour. Consequently, the population growth is negligible, and life expectancy is very low. This stage typically represents a traditional, agrarian society with limited technological advancement and widespread poverty.

Stage II: Early Expanding Stage

The second stage, known as the early expanding stage, is marked by a significant decline in the death rate while the birth rate remains high. This fall in mortality is mainly due to improvements in food supply, sanitation, public health measures, and the introduction of vaccinations and medical interventions. However, societal norms

and values continue to favour large families, leading to a widening gap between the birth and death rates. These results in a sharp increase in population often referred to as a "population explosion". Industrialisation and urbanisation usually begin during this phase, bringing moderate economic growth and infrastructural development.

Stage III: Late Expanding Stage

In the third stage, the late expanding stage, the birth rate begins to decline due to greater awareness of family planning, increased literacy (particularly among women), and changing attitudes towards family size. As societies become more urbanised and educated, the economic costs of raising children increase, encouraging smaller families. At this point, the death rate remains low, leading to continued population growth, but at a slower pace. Access to contraception, rising female employment, and improvements in child survival rates contribute to the reduction in fertility. This stage represents a transition in social and economic values, where personal aspirations and lifestyle choices begin to influence reproductive behaviour.

Stage IV: Low Stationary Stage

The fourth stage, or the low stationary stage, is characterised by low birth and death rates. Population growth becomes minimal or reaches a plateau. Societies in this stage are typically highly urbanised, industrially advanced, and enjoy high standards of living. Medical care is of superior quality, and individuals tend to marry later and have fewer children. The population becomes more stable, with demographic equilibrium achieved through controlled fertility and mortality. Social norms emphasise quality of life, personal development, and economic stability over larger family sizes.

Some scholars also propose a fifth stage, the declining stage, observed in several developed countries. In this phase, birth rates fall below death rates, resulting in a natural decline in population unless offset by immigration. This leads to an ageing population, with implications for labour markets, social security systems, and economic productivity. The challenges in this stage often prompt governments to implement policies encouraging higher fertility rates or greater immigration to sustain economic growth and support the elderly population.

In the context of India, the country is believed to be in the late part of the third stage, gradually transitioning towards the fourth. Death rates have fallen substantially due to improvements in healthcare, nutrition, and sanitation. Birth rates have also been declining, though not uniformly across regions. Urban areas and southern states have seen sharper declines, while some northern and rural regions still show high fertility. Government initiatives focusing on family planning, women's health, and education have played a key role in this transition.

The Theory of Demographic Transition serves as an essential analytical framework in population studies. It helps explain how demographic changes align with economic and social development. While its progression may vary across countries due to cultural, political, and economic differences, the theory remains a foundational concept in understanding population dynamics and guiding public policy in health, education, and employment.

Recap

- Malthus warned population grows faster than the food supply, leading to poverty and famine
- The Optimum Theory says maximum welfare is achieved at a population size that maximises per capita income
- Overpopulation reduces per capita income, while underpopulation underutilises resources
- Dalton introduced a formula to measure deviation from the optimum population
- Demographic Transition Theory explains population changes through four stages with economic development
- Stage I has high birth and death rates; Stage II sees falling death rate; Stage III sees falling birth rate; Stage IV has low birth and death rates
- A possible Stage V includes a declining population due to very low birth rates
- India is in the late Stage III, with declining birth and death rates and regional variations

Objective Questions

1. What theory links population to per capita income maximisation?
2. Who developed the mathematical formula for optimum population maladjustment?
3. What is the final stage of the demographic transition model called?
4. What theory replaces the food-population linkage with an income and resources balance?
5. Who said the demographic transition begins with a fall in death rate and ends with a fall in birth rate?
6. What economic term denotes population size beyond resource capacity?
7. What is the main indicator in Dalton's population formula?

8. What stage has a declining birth rate but a low death rate?
9. What stage reflects very low birth and death rates?
10. What demographic phase shows rapid growth due to a falling death rate?

Answers

1. Optimum Theory
2. Dalton
3. Low stationary
4. Optimum Theory
5. E.G. Dolan
6. Overpopulation
7. Maladjustment
8. Stage III
9. Stage IV
10. Stage II

Assignments

1. Explain the Optimum Theory of Population.
2. Discuss the stages of the Demographic Transition Theory.
3. Critically examine the assumptions and limitations of the Optimum Theory of Population.
4. Compare and contrast the Optimum Theory of Population and the Theory of Demographic Transition.

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BLOCK

Environmental Economics

UNIT 1

Environment and Development

Learning Outcomes

After completing this unit, the learner will be able to:

- discuss how environmental factors influence economic and social development
- know the principles of sustainable development
- describe development practices that balance economic growth with environmental protection

Prerequisites

We know that, to attain rapid economic development, we definitely should increase our economic activities. For doing so, we require different kinds of resources or raw materials. For the production and consumption activities, we directly or indirectly depending on Nature or our mother Earth. Nature provides different natural resources for the smooth functioning of every economy in the world. The relationship between environment and development is a critical aspect of sustainable growth, where economic activities rely heavily on natural resources, and our actions have a significant impact on the environment. Sustainable development aims to strike a balance between economic growth, social inclusion, and environmental protection, ensuring that we meet our present needs without compromising the ability of future generations to meet theirs. The United Nations' 2030 Agenda for Sustainable Development outlines 17 interlinked goals, including ending poverty, achieving food security, reducing greenhouse gas emissions, and promoting sustainable use of oceans and terrestrial ecosystems. To achieve sustainable development, it is essential to prioritise intergenerational equity, integrate environmental, social, and economic goals, and promote inclusive and equitable growth that benefits all individuals and groups. By understanding these concepts and working collaboratively, we can create a more sustainable future-

one that balances economic, social, and environmental needs, ultimately ensuring a better quality of life for present and future generations.

Keywords

Environment, Population, Poverty, Sustainable Development, UNCED, Industrialisation, Urbanisation

Discussion

6.1.1 Relationship between Environment and Development

According to the Environmental Protection Act of 1986, Environment can be defined as, "the sum total of air, water, and land, interrelationship among themselves, with human beings, other livings organisms and property'. This defenition implies that, the environment is a combination of air, water, and land and how they are interdependent with each other Moreover, it is important to understand how humans, other living organisms, and non-living components of the environment interact with one another and with nature.

According to Prof.Kindleberger, economic development is a continuous process which must be extended over a long period of time, and it can break all evils in the economy like poverty, unemployment, etc. and lead the country to a stage of self-sustaining growth or to self-generating growth.

Both environment and economic development are interrelated. The environment provides all kinds of resources for economic activities such as production and consumption. That is, world economies are directly or indirectly depending on nature or the environment to get resources, especially natural resources or capital, namely air, water, land, forest, etc. At the same time, we are using such resources to increase our production and productivity and consequently, waste is generated, and the quality of the environment may be damaged.

Recently, a lot of discussions have been going on relating to the degradation of environmental quality, climate change, and global warming and the impact of all these degradations on the future development of all types of economies like both developed and developing. In order to analyse such consequences, a worldwide meeting was conducted in 1992 at Rio in Brazil and it was popularly termed as 'Earth Summit' or 'Rio Conference' or 'United Nations Conference on Environment and Development (UNCED) and more than 150 countries of the world participated in that conference to find out the implications of environmental damage to the future generations or future

developmental activities. The Earth Summit clearly pointed out the interconnection between natural resources and economic development and introduced a new concept called 'sustainable development'. This conference can bring greater awareness of environmental issues and enhance cooperation between different countries to fight against the global problems facing by world economies, such as the problem of global carbon emissions and climate change.

In a developing country like India, the conflict between economic development and environmental quality becomes severe due to the problem of a growing population and the problem of poverty. For rapid economic development, one country requires large-scale industrialisation, urbanisation, high-yielding technologies in agriculture and allied activities, which all degrade environmental quality. Then we must think about the necessity of sustainable development and find out solutions to different environmental issues and bad impacts of climate change.

There is a growing argument that state governments take initiatives to control environmental pollution, clean rivers, and fight against climate change. At a conference held in Glasgow in 2021, Prime Minister Shri Narendra Modi announced that India will achieve net zero carbon emissions by 2070. He outlined the 'Panchamrit' (five commitments), which include: raising the country's non-fossil fuel-based energy capacity to 500 GW by 2030; meeting 50% of energy requirements from renewable sources; reducing total projected carbon emissions by one billion tonnes; reducing the carbon intensity of the economy to less than 45%; and achieving net zero emissions by 2070. These goals form the foundation for India's plans to increase renewable energy use and to shift towards electricity and hydrogen fuels for transportation.

This statement focuses on the fact that India's growth and development are taking place in a fast manner at the cost of the environment, and to stop further reduction in natural resources and protect the environment from pollution, stringent regulations and incentives are needed.

While considering the interrelation between environment and development, we must consider some economic challenges and how those challenges threaten our environment. Or the inter-relations between environment and development can be explained with the help of the following concepts.

1. **Population and Environment:** When the world population is increasing, environmental degradation will take place. That is, to meet the growing needs of rising population, we are compelled to extract more resources from nature. Environmental resources such as air, water, etc. are very critical, and we cannot substitute that capital with manmade or human capital. When the population is increasing, they require food, nutrition, water supply, sanitation facilities, power supply, public parks, library, educational institutions, hospitals, roads, railways, and so on. All these facilities can be arranged only at the cost of environmental resources. It threatens total environmental quality, and environmental degradation will be a reality. Moreover, excess population badly affect the carrying capacity of this mother earth. If man is not ready to control its population, some deliberate check will happen through natural disasters like earthquake, flood, draught, etc.

That is, an increase in population leads to over exploitation of natural resources, and sometimes it may reduce the regeneration capacity of such renewable resources. Moreover, a growing population compel us to cultivate the arable land by using chemical fertilisers and pesticides, which reduces the natural fertility of the surface soil. Deforestation, desertification, pollution, etc. are the byproducts of an increase in population.

The Energy and Research Institute (TERI) made an estimation of loss of economic well being and found that because of soil degradation, diseases caused by pollution and degradation of forest brought about around a loss of 100,000 to 450,000 crore every year and, along with this serious ecological destruction. A growing population leads to loss of biodiversity, and it will endanger the sustainability of agriculture and food security in the country. Dr. M S Swaminathan, Father of Green Revolution said that, "the capacity to support even the existing human and animal population has been exceeded in many parts of the world" and if we are not ready to check the rate of growth of population, it will threatens the objective of attainment of food security. Therefore, population reduction is a great necessity.

2. **Poverty and Environment:** Another factor responsible for environmental destruction is the growing poverty, especially in developing countries. For the very existence of poor people, they are relying on natural resources. They are forced to cut forests for fuel, timber, as well as grazing of their cattle on pastureland, and this may sometimes lead to the tragedy of the commons. Environmental degradation leads to further poverty, and a vicious circle of poverty may occur. That is, rural poor are earning a good number of their livelihood from the un marketed natural resources like common grazing land, food and fodder from the forest, fuel and building materials gathered by them, then the degradation of such resources may harm the poor further and it may increase the degree of poverty. Therefore, if we are taking some steps to protect the environment from degradation, it should be accompanied by some measures to eradicate poverty of the people who depend on natural resources for their livelihood. Here we can quote Todaro and Smith. According to them, "for environmental policies to succeed in developing countries, they must first address the issues of landlessness, poverty and lack of access to institutional resources. Insecure land tenure rights, lack of credit, and inputs and absence of information often prevent the poor from making resource augmenting investments that would help preserve the environmental assets from which they derive their livelihood".

3. **Business and Environment:** The business firms are related to the environment in two ways. First, they require natural resources such as land, energy resources, wood, and water for their production functions. Most often, in their early stages, industries - particularly infant industries tend to depend heavily on the environment. As they develop, they may transform into more technologically oriented sectors, there by reducing their direct dependence on environmental resources

   Secondly, production activities of industries will lead to the destruction of the environment in all senses. Industries are emitting different harmful gases into the air, water, and they are totally polluting the environment which

brings some market failure. That is, the business enterprises fail to calculate the social cost happening to the society due to their production functions. Bhopal gas tragedy is one such prime example of polluting industries in urban areas, which possess a threat not only to natural resources but also to the life and health of the people.

Case study

Bhopal Gas Tragedy:

Bhopal Gas Tragedy was one of the world's worst industrial accidents occurred in Madhya Pradesh, Bhopal, in India on 2nd and 3rd December 1984. It was a Union Carbide company which is manufacturing a pesticide called Carbamate using Methyl Isocyanate (MIC). The accident was due to the entry of water in the tank, and reaction mixture got overheated and because of the failure of its cooling system, it exploded. By this, 40 tons of MIC leaked into the atmosphere. MIC gas will affect lungs and eyes and will cause irritation in the skin. Higher amounts of MIC will remove oxygen from the lungs and can cause death. The gas spread around 40 km^2 area and around 5100 persons killed on the spot. About 2,50,000 persons got exposed to MIC. Many persons suffered from severe respiratory problem, neuromuscular problem, gastrointestinal and gynecological disorders etc. In addition to this loss of human lives, around a cost of $570 million required to clean up and damage settlements.

In our capital, Delhi, many industrial units were located in congested residential areas, in complete violation of environmental laws. Due to political pressure and vote-bank considerations, the concerned administrative departments are often unable to take effective action to reduce the number of industries operating in those areas. A similar situation exists in other metropolitan areas of India, like Mumbai, Kolkata, etc. For the establishment of large industrial projects in India, proper clearance is required from the Ministry of Environment and Forests. However, due to political pressure and corruption, these projects often obtain clearance and commence operations despite regulatory concerns.

Land acquisition and environmental concerns are two major challenges facing our country. To achieve the goal of a green economy, proper guidelines must be implemented for initiating projects by both the public and private sectors. Development should not come at the cost of the environment; instead, policies must be adopted that strike a balance between economic growth and ecological sustainability..

For that, the government of India has suggested an organisational structure to evaluate the functioning of different industries;they are to prepare an annual environmental performance report.

4. **Changes in Consumption from Income Growth:** Another fact that accentuates the environmental degradation is the increase in consumption due to an increase in income. It is a common fact that, when income increases, the marginal propensity to consume will increase. Then, more production, more resource extraction, and more waste are the results. That will damage the environment and deplete environmental resources. Increased income may change the diet of people, especially richer sections, and they may demand more animal-based products that will reduce the biodiversity capacity of a region.

5. **Increase in Capital and Investment:** An increase in investment in infrastructural facilities can lead to environmental damage. Transformational infrastructure, technological infrastructure, etc. will reduce natural resources and degrade it. Moreover, when the government is adopting measures to increase agricultural productivity like green revolution; high yielding varieties of seeds and chemical pesticides and insecticides etc. will reduce the fertility of the soil, and will contaminate nearby rivers through agriculture run off.

6. **Absence of Property Rights:** Property right means the right to protect or conserve environmental resources or public property for the common benefit. To conserve such natural resources, the concerned authorities are allowing property rights to some agencies or persons, and they have the sole right to protect. Most often, in their early stages, industries - particularly infant industries - tend to depend heavily on the environment. As they develop, they may transform into more technologically oriented sectors, thereby reducing their direct dependence on environment. But in developing countries, such allocation of property rights is not a common thing. Therefore, people in developing countries are using common resources without any control,whichwill lead to their destruction. Therefore, in order to protect environmental resources, proper property rights should be allocated to the people concerned, and we can break the problems of the tragedy of the commons.

7. **Trade:** Another factor which leads to environmental damage is the expansion of international trade activities. International trade could influence environmental quality in three ways like scale effect, composition effect and technique effect. Scale effect is the result of increased production for exchange. Increased production means increased waste generation and destruction of the environment. The composition effect means, when trade is expanding, the export basket and import basket are changing, and such changes will bring harmful effects on the environment. Technique effect involves technology transfers and adoption of most modern technologies, which may sometimes reduce the quality of the environment. That is, international trade and increasing foreign demand can have significant impacts on a firm's pollution levels..

8. **Increase in Market Competition:** Another factor affecting environmental quality is an increase in market competition. When the market is filled with producers who produce more or less similar commodities, competition arises

automatically, and that will lead to the exploitation of natural resources and thereby exhaust environmental resources.

Economic growth and development ultimately lead to environmental destruction. From the foregoing discussion, we can see that population, poverty, business activities etc., affect the environment badly, and if the government take proper regulatory measures to limit growth, we can go hand in hand with economic development and environmental quality.

Recap

- Sustainable development needs joint efforts to protect resources
- Use natural resources efficiently for sustainability
- Environment includes air, water, land, and their relationships
- Economic growth is more output; development is growth plus structural change
- Environment supplies resources for production and consumption
- Earth Summit raised awareness and cooperation on environmental issues
- Industrialisation, urbanisation, and modern farming harm the environment
- Environment development link covers factors like population growth, business activities, poverty, and trade

Objective Questions

1. According to the Environmental Protection Act of 1986, the environment includes:
2. Who defined economic development as including both more output and changes in technical and institutional arrangements?
3. The 1992 conference held in Rio de Janeiro is popularly known as:
4. Which of the following is NOT one of the 'Panchamrit' goals proposed by India at the Glasgow conference (2021)?
5. Which of the following statements about population and environment is true?

6. According to Todaro and Smith, for environmental policies to succeed in developing countries, they must:

7. The Bhopal Gas Tragedy was caused by the leakage of which harmful gas?

8. Which of the following best describes the "tragedy of the commons"?

9. Which of the following is an impact of increased income on the environment?

10. What is the main reason for environmental damage from trade, according to the content?

Answers

1. Air, water, land, and their interrelationships with living organisms and property

2. Kindleberger

3. Earth Summit.

4. Ban all industrial activities by 2035

5. Overpopulation leads to environmental degradation and loss of biodiversity

6. Address landlessness, poverty, and lack of institutional access

7. Methyl Isocyanate (MIC)

8. Uncontrolled use of common resources leads to degradation.

9. Increased demand for resource-intensive goods

10. Scale, composition, and technique effects

Assignments

1. Analyse the interrelationship between economic development and environmental degradation. How can Sustainable Development be achieved in this context?

2. Examine the role of population growth and poverty in environmental degradation, especially in the context of developing countries like India.

3. Discuss the impact of industrialisation and business activities on environmental quality. Refer to specific cases like the Bhopal Gas Tragedy and urban industrial expansion.

4. Evaluate the environmental challenges arising from economic growth factors like income rise, infrastructure development, and market competition. Suggest regulatory and policy measures to address these issues.

5. "Development should not be at the cost of the environment." Critically examine this statement in the light of India's commitments at the Glasgow conference and the concept of green economy.

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UNIT 2

Scope and Importance of Environmental Economics

Learning Outcomes

After completing this unit, the learner will be able to:

- define environmental economics using economic principles
- discuss the scope of environmental economics
- insight into the importance of environmental economics

Prerequisites

In the early 2000s, the town of Vapi in Gujarat was declared one of the most polluted places in India. Positioned along the banks of the Damanganga River, Vapi had grown into a busy industrial hub, home to hundreds of chemical, textile, and pharmaceutical factories. These industries brought employment, exports, and economic prosperity to the region. Trucks moved day and night, carrying goods to ports, "factories operated round the clock, and real estate prices soared. On the surface, it was a textbook success story of economic growth.

But beneath the surface, quite literally, trouble was brewing. The groundwater in the region turned toxic. Studies revealed dangerously high levels of mercury, heavy metals, and other carcinogens in both water and soil. The river, once a source of drinking water and agriculture, had become dark and foul-smelling. Fishermen abandoned their trade, unable to find a catch. Cases of cancer, skin diseases, and respiratory problems surged. Women in nearby villages suffered high rates of miscarriage and infertility. Children fell sick more frequently. The local population began to ask: was this kind of development truly worth the cost?

This tragic contradiction, between industrial advancement and ecological collapse, lies at the heart of environmental economics. Vapi's case was not a failure of economic ambition", it was a failure of integrating environmental wisdom into

economic decision-making. The factories had generated profits, but those profits were made at the cost of environmental destruction and public health, costs that were never included in market prices or policy considerations.

The story of Vapi mirrors countless other places around the world, where growth is prioritised without accounting for environmental consequences, highlighting the need for a framework that balances economic benefits with ecological sustainability. Environmental economics provides that framework. It helps us ask the right questions: Who bears the cost of pollution? How should we measure environmental damage? Can we assign value to clean air or safe drinking water? And how do we ensure that economic progress today does not destroy the ecological base needed for tomorrow?

Keywords

Environmental Economics, Sustainable Development, Market Failure, Externalities, Pollution, Natural Resources, Climate Change

Discussion

6.2.1 Environmental Economics

Environmental Economics is a specialised area within economics that focuses on the complex relationship between the economy and the environment. It studies how economic activities affect the environment and, conversely, how environmental issues influence the economy. This branch of economics emerged as a response to the increasing awareness of environmental degradation, climate change, and the unsustainable use of natural resources. Unlike traditional economics, which primarily focuses on production, consumption, and market behaviour, environmental economics expands the lens to include natural ecosystems as vital components of economic systems. In practical terms, environmental economics examines how economic principles can be applied to manage natural resources efficiently and to design policies that address pollution, conservation, and environmental protection. It integrates insights from ecology and environmental science with economic tools to propose balanced and sustainable solutions. The role of environmental economics is key in today's world, where environmental concerns are becoming central to policy-making and international discourse. It helps economists, policymakers, and the public to understand the trade-offs between economic growth and environmental sustainability. This field supports the development of regulatory mechanisms such as carbon pricing, pollution taxes, and emissions trading systems. By assigning monetary values to environmental goods and damages, environmental economists aim to internalise environmental costs that are often ignored in standard market transactions.

A central challenge that environmental economics tries to address is the problem of "externalities". These are the unintended side effects of economic activities that affect third parties, often negatively, without being reflected in market prices. For instance, a factory emitting smoke into the air contributes to air pollution that affects public health, but these costs are not borne by the factory unless regulatory interventions are in place. Environmental economics proposes ways to correct such market failures by incorporating these externalities into the cost of production and consumption. Consider the case of a thermal power plant located near a residential area. While the plant generates electricity, a critical driver of economic development, it also emits greenhouse gases and particulate matter that have led to respiratory issues among nearby residents.

Traditional economic analysis might celebrate the power plant for its contribution to GDP and employment, but environmental economics compels us to evaluate the broader impact. Through methods such as cost-benefit analysis, environmental economists estimate both the economic gains from electricity production and the environmental and health costs borne by the community. The findings might lead to recommendations such as upgrading to cleaner technology, relocating the plant, or implementing emission charges to reduce pollution levels. This approach ensures that economic decisions are not made in isolation from their environmental consequences.

Environmental economics plays a major role in bridging the gap between economic development and ecological balance. It equips society with the tools to pursue progress while respecting the limits of nature. As environmental challenges become more complex and global in nature, the importance of environmental economics continues to grow. By understanding and applying its principles, societies can move towards more informed, fair, and sustainable economic practices.

6.2.2 Scope of Environmental Economics

The scope of environmental economics is vast and interdisciplinary, covering a wide array of issues that arise from the interaction between the economy and the environment. It addresses not just the problems of pollution and resource depletion, but also explores sustainable development, ecosystem services, natural capital accounting, and environmental justice. As environmental challenges have become more complex and global, the boundaries of environmental economics have also expanded to incorporate newer themes such as climate change economics, biodiversity conservation, and green finance. Environmental economics traditionally focuses on understanding and managing the economic dimensions of environmental issues. Some of the key areas include:

- **Pollution Control and Management**: This involves analysing the sources and impacts of air, water, and land pollution and devising economically efficient methods to reduce them. For instance, economists may design pollution taxes or tradable emission permits to incentivise cleaner production.

- **Valuation of Environmental Resources**: Many environmental goods like clean air, scenic landscapes, or biodiversity do not have a market price. Environmental economics develops techniques to assign monetary value to

such goods through methods like contingent valuation, hedonic pricing, and travel cost models.

- **Natural Resource Economics**: This aspect deals with the optimal use of renewable and non-renewable resources such as forests, water, minerals, and fossil fuels. It helps determine how these resources can be allocated over time to ensure long-term sustainability.

- **Cost-Benefit Analysis of Environmental Policies**: Before implementing a policy, it is crucial to weigh its costs and benefits. Environmental economics provides a framework to assess whether a proposed environmental regulation or investment (like building a dam or conserving a forest) is economically justified.

- **Climate Change Economics**: This growing subfield evaluates the economic causes and consequences of climate change. It also helps design international agreements and national policies aimed at reducing greenhouse gas emissions.

The scope of environmental economics extends beyond the traditional boundaries of economics. It draws on insights from ecology, geography, public health, political science, and sociology. For example, understanding the health impact of pollution requires data from medical research, while crafting international environmental treaties involves knowledge of global political relations. This interdisciplinary nature enhances its ability to tackle real-world problems in a holistic way.

Environmental economics plays a key role in the formulation of policies at both national and international levels. Governments use their tools to create taxation systems that discourage environmental harm, promote clean energy, and regulate the exploitation of natural resources. Institutions such as the World Bank, United Nations, and national planning bodies rely heavily on environmental economic assessments while framing environmental action plans. A real-world example is the introduction of carbon taxes in countries like Sweden and Canada. These taxes, designed using economic models, aim to reduce carbon emissions by making it more expensive to pollute, thereby encouraging firms and households to shift towards greener alternatives.

The scope of environmental economics is not limited to academic theory. It actively contributes to building a sustainable world by shaping environmental awareness, influencing corporate practices, and informing public policy. Whether it is managing urban waste, conserving water in agriculture, or pricing carbon emissions, environmental economics provides practical and economically sound approaches to solving today's pressing environmental problems.

6.2.3 Definition of Environmental Economics

Environmental economics can be defined as the branch of economics that studies how economic activities and policies influence the environment, and how economic tools can be used to solve environmental problems. It involves the application of economic theories and methods to understand the causes of environmental degradation

and to develop solutions that promote sustainable development. A commonly accepted definition is: "Environmental economics is the study of how the economic system and the environment interact, with a focus on how to develop policies that promote environmental sustainability alongside economic growth." In formal terms, environmental economics seeks to internalise the external costs (or externalities) associated with environmental degradation, such as pollution, deforestation, or climate change, by integrating them into the market decision-making process. This is done through instruments like taxes, subsidies, regulations, and property rights. The aim is to align private incentives with social and ecological well-being.

Environmental economics is a specialised sub-discipline within economics that deals with the relationship between economic systems and the natural environment. It studies how human economic activities, such as production, consumption, and trade, impact the environment, and how environmental changes, in turn, influence the economy. The fundamental aim of environmental economics is to understand and address the economic causes of environmental degradation and to propose solutions that promote both economic efficiency and environmental sustainability.

At its core, environmental economics operates on the principle that environmental resources, like air, water, forests, and biodiversity, are scarce and must be allocated efficiently just like other economic goods. However, many of these environmental goods are not traded in traditional markets, and their value is often overlooked in decision-making. As a result, environmental degradation occurs because market prices fail to reflect the true social and ecological costs of using these resources. This leads to market failure, particularly in the form of externalities, where the costs of environmental harm (such as pollution) are borne by society rather than the polluters.

Environmental economics addresses these failures by introducing mechanisms to internalise such external costs. This means making sure that those who harm the environment are financially responsible for the damage they cause. It does so through tools like pollution taxes, carbon pricing, cap-and-trade systems, and regulations. These mechanisms aim to align private economic interests with broader public environmental goals.

Moreover, environmental economics employs a range of methods to assign economic value to non-market environmental goods, such as clean air, scenic beauty, or wildlife habitats. Valuation techniques, including contingent valuation, hedonic pricing, and travel cost methods, help quantify the benefits of environmental protection and the costs of environmental degradation. These values are essential for conducting cost-benefit analyses, which compare the economic benefits of a project or policy with its environmental costs, thereby aiding rational decision making.

Environmental economics also plays a key role in designing policies that ensure sustainable development, a form of growth that meets current needs without compromising the ability of future generations to meet theirs. It advocates for an economic system where natural resources are used wisely, ecological systems are preserved, and economic progress goes hand in hand with environmental responsibility.

Environmental economics provides the intellectual and analytical framework to tackle pressing environmental issues within the structure of economic reasoning. It does not oppose development but insists that development must be fair, inclusive, and environmentally sound. As environmental problems become increasingly complex and global in nature, the importance of environmental economics continues to grow.

6.2.4 Importance of Environmental Economics

The importance of environmental economics has significantly increased in recent decades, mainly due to rapid industrialisation, urbanisation, and the escalating scale of environmental crises. This field now plays a vital role in guiding economic decisions that have far-reaching ecological impacts. It is important for several key reasons:

1. **Correcting Market Failures:** Markets often fail to account for the environmental costs of economic activities. For instance, a factory might pollute a river while producing goods, but this cost is not reflected in the price of the product. Environmental economics addresses this failure by promoting policies that internalise these externalities, such as pollution taxes or cap-and-trade systems.

2. **Promoting Sustainable Development:** Sustainable development aims to meet the needs of the present without compromising the ability of future generations to meet theirs. Environmental economics provides the tools to assess long term environmental impacts and helps in designing growth strategies that do not deplete natural resources or damage ecosystems.

3. **Informed Policy Making:** Governments need reliable data and models to make environmental decisions. Whether it is setting fuel efficiency standards, banning single-use plastics, or investing in renewable energy, environmental economics provides cost-benefit analyses and policy simulations that inform such decisions.

4. **Economic Valuation of Nature:** Many elements of the environment, clean air, groundwater, and biodiversity, do not have a market price, making them vulnerable to overuse and neglect. Environmental economists develop valuation techniques to estimate their economic worth. These valuations are crucial for justifying conservation projects, compensation for environmental damage, or investment in green infrastructure.

5. **Addressing Global Challenges:** Issues such as climate change, biodiversity loss, and air pollution are global in scale. Environmental economics plays a crucial role in shaping international agreements (like the Paris Agreement) and developing cross-border strategies to tackle these shared challenges.

Consider the case of plastic waste management. In the absence of regulation, companies may produce and use plastic freely, contributing to ocean pollution and harming marine life. Environmental economists analyse the total social cost of plastic usage and may propose a plastic tax or a deposit-refund scheme. These policies aim

to reduce usage, encourage recycling, and fund environmental clean-up, all through economic incentives.

Environmental economics is not just a theoretical discipline; it is a powerful tool for real world problem solving. By integrating environmental concerns into economic thinking, it helps create a future where economic growth and environmental conservation go hand in hand. Its significance continues to grow as we face more urgent and interconnected ecological and economic challenges in the 21st century.

Recap

- Environmental economics studies how the economy and environment affect each other
- Uses economic tools to manage resources and solve pollution and sustainability issues
- Externalities like pollution are key challenges addressed in environmental economics
- Cost-benefit analysis helps evaluate both economic and environmental impacts of decisions
- The scope includes pollution control, resource use, climate economics, and valuation of nature
- Usetools like pollution taxes, tradable permits, and environmental impact assessments
- Environmental economics is interdisciplinary, drawing from ecology, health, and policy
- It is important for correcting market failures and promoting sustainable development
- It supports informed policies and values nature's benefits for long-term planning
- Environmental economics plays a role in addressing global issues like climate change

Objective Questions

1. What does environmental economics study?
2. What problem arises when the costs of pollution are not included in market prices?
3. What analysis method compares the environmental costs and benefits of projects?
4. What is the term for unintended negative effects of production on others?
5. What pricing tool makes pollution more expensive for producers?
6. Which field of economics integrates ecology and environmental science with economic tools?
7. Which economic problem occurs when benefits or costs affect third parties?
8. What type of policy helps internalise environmental costs?
9. What economic instrument allows trading rights to pollute within a set limit?
10. Which sector uses environmental economic assessments for project evaluation?
11. What kind of development balances current needs without harming future generations?
12. Which concept highlights the limits of ignoring environmental costs in traditional economic decisions?

Answers

1. Interaction between the economy and the environment
2. Externalities
3. Cost-Benefit Analysis
4. Externalities

5. Pollution Tax
6. Environmental Economics
7. Externality
8. Pollution Tax
9. Emissions Trading
10. Government
11. Sustainable Development
12. Market Failure

Assignments

1. Differentiate between traditional economics and environmental economics.
2. Why is valuation of environmental resources important in environmental economics?
3. Explain with an example how environmental economics helps in correcting market failures.
4. Discuss the importance of environmental economics in today's world.

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UNIT 3

Market Failure and Public Goods

Learning Outcomes

After completing this unit, the learner will be able to:

- dicuss the concept of public goods
- comprehend environmental quality as a public good
- get an insight into the importance of public good
- describe common property resources and the tragedy of the commons

Prerequisites

We know that our planet Earth is directly or indirectly providing different resources for our economic activities, like production and consumption. The environment is for all, and the resources providedby the environment areusedby all without any direct payment to the environment. That is, environmental resources, both renewable and non-renewable resources, are a gift of nature. For example, air, water, sunlight, etc. are obtained byall without making a direct payment for them. In this situation, we can consider the environment as a public good, and it is available to all. Generally, public goods have some features. All such features are applicable in the case of the environment also. So,this unit can make a discussion on the features of public goods, externality and market failure and the tragedy of the commons.

Keywords

Public Good, Environmental Quality, Externalities, Common Property Resources, Tragedy of Commons

Discussion

6.3.1 Environment as a Public Good

Environmental quality is a general term which includes different characteristics like air and water purity or pollution, noise, access to common property, aesthetics, and the probable effects on physical and mental health. Normally, we consider environmental resources or environmental quality as public goods. The reason is that most of the features of public goods that were discussed above are applicable to environmental resources. For example, air, water, soil, etc., are not confined to one individual, and it is for all.

The use of air by one person does not diminish its availability for others; therefore, it is non-rival in nature. Moreover, no one can be excluded from using air, making it a non-excludable resource i,e. the exclusion principle is not applicable in the use of air and environmental resources in general.

Air also provides collective satisfaction, and it is indivisible in nature. Almost all natural resources satisfy all features of public goods. That is why it is said that environmental quality is a public good. Therefore, it is our responsibility to maintain the quality of our environment and handover it over to the next generations. Environmental quality is important because the environment directly affects both physical and mental health, and it plays a vital role in determining quality of life, life expectancy, and health disparities. Poor air quality, for example, can lead to premature death, cancer, and long-term damage to the respiratory and cardiovascular systems..

Environment as a public good can be used in two ways. Firstly, it provides consumption goods that can be measured quantitatively, i.e., in physical units, and it provides raw materials which are qualitatively valued and used in the industrialisation process. The environment provides all these amenities at zero cost;therefore, there is a possibility of over exploitation, and hence the resources become scarce. Such scarcity will reduce the standard of living of the people. Thus, to maintain environmental quality, people are willing to pay more to protect the environment and hence improve their welfare and their living conditions. Due to the features of public goods, the market is failing to provide environmental resources.

6.3.1.2 Public Good:Features

A public good is one that is both non-excludable and non-rivalrous, meaning that individuals cannot be effectively excluded from its use, and one person's use does not reduce its availability to others.

A public good is one that is both non-excludable and non-rivalrous, meaning that individuals cannot be effectively excluded from its use, and one person's use does not reduce its availability to others.

We can explain public goods based on theirfeatures. Public goods are non-rival, non-excludable, indivisible, and for collective satisfaction. Among them, two important features are non-rivalry and non-exclusion.Non-rivalry means there is no scope for rivalry in the consumption of public goods. That is, consumption by one person will not reduce the amount available to others. For example, the use of a public road by one person does not reduce its availability to others.

Another feature of a public good is that the exclusion principle cannot be applied. That is, all persons are included in the consumption of goods. For example, defence is a public good and all persons are included in the use of defence.

Another feature of a public good is indivisibility**.** That is, we cannot divide the public good into small quantities. That is, consider the same example, defence, in which we cannot divide the use of defence to individual units.

Another feature of a public good is that it is for collective satisfaction. That is, normally, public goods are for the collective satisfaction to attain social welfare.

6.3.2 Market Failure in the Presence of Externalities

Market failure is the inefficient distribution of goods and services in the market. Externalities lead to market failure because a product or service's market price does not accurately reflect the true costs and benefits of that product or service. Market failure is a situation in which the market forces push in such a way that individual decision does not leads to socially desirable outcomes. If there are negative externalities, marginal social cost will be more than that of marginal private cost. Marginal social cost is the sum of marginal private cost of production and the cost of negative externality associated with that production. It includes all costs borne by the society. When there is negative externality, marginal social cost will be more than that of marginal private cost. Marginal social cost is the sum of cost of production with cost of negative externality associated with the production of that commodity. The feature of negative externality can be explained with the help of the figure.

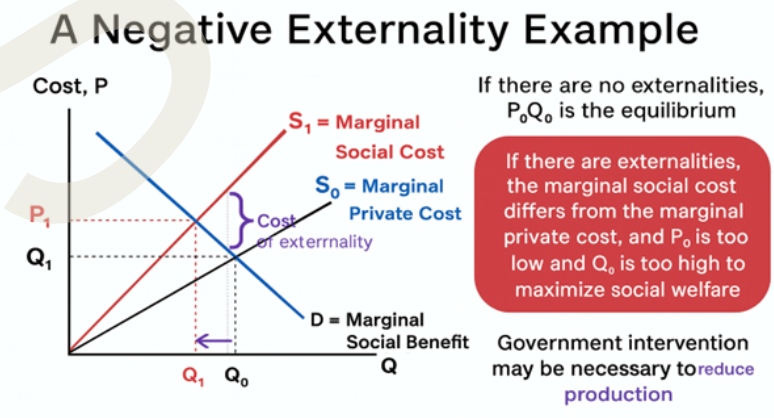

Fig 6.3.1 Negative Externality

In the above figure, S_1 represents the social marginal cost curve, S_0 represents the marginal private cost curve, and D represents the marginal social benefit curve. If social

costs are not taken into consideration, the total output will be Q_0, and the corresponding price will be P_0. The difference between S_0 and S_1 shows the cost of an externality. To reduce externality, the government should intervene and give permission to produce Q_1 quantity at P_1 price.

Generally, market failure results from several factors, such as imperfect knowledge, the existence of differentiated commodities, resource immobility, inefficiency in providing adequate goods and services, the presence of external costs and benefits, and widespread inequality. Some of the measures to correct market failure are the provision of property rights, taxation, subsidies, prohibition of the production of certain goods, regulation of some goods, state intervention, redistribution of income, etc.

6.3.3 Externalities: Positive and Negative

Externality is a cost or benefit that occurs in an economy when the production or consumption of a specific good or service affects a third party that is not directly related to the production or consumption of that good or service. It is also known as third-party effect or spillover effect, or neighbourhood effect. Externality may be either positive or negative. Positive externality means the production or consumption activities of one party affect the other positively, or a benefit is showered on the third parties. For example, the provision of education to a community positively affects the nearby society, and coming generations will benefit from it. And the investment in education leads to a skilled, efficient, and innovative workforce forthat society.

On the other hand, a negative externality refers to a situation where the production or consumption activities of one person negatively affect others who have no direct involvement with the producer or consumer.

On the other hand, a negative externality refers to a situation where the production or consumption activities of one person negatively affect others who have no direct involvement with the producer or consumer That is some costs are involved with the third parties. For example, smoking by one person may help him to get some satisfaction at the same time, the nearby people will face suffocation or such kind of health problems.

Normally, most externalities are negative. Pollution is a well known negative externality. A private firm implementing new methods of production may reduce its cost, but at the same time, its emissions towards the environment may be comparatively high. Externalities are negative when the social marginal costs outweigh the private marginal costs.

Almost all externalities are technical externalities. Technical externalities have an impact on either the consumption or the production opportunities of unrelated third parties, but the price of consumption does not include the externalities. This exclusion creates a gap between the gain or loss of private individuals and the aggregate benefit or loss to society as a whole. Many economists consider these kinds of technical externalities lead to market failure, and this is the reason the decision making bodies advocate for government intervention to curb negative externalities through pricing techniques and

other direct actions. To overcome the negative externalities, the government can use both pricing techniques, like taxation, subsidies, and direct actions. To reduce negative externalities such as pollution, governments can impose a tax on the goods causing the externalities. Such taxes are also called Pigouvian tax or emission charge or residual tax, etc. Taxes discourage producers from producing those goods that create negative externalities.

Subsidies can also be used by the government to overcome the negative externality problem. Subsidies can be provided to produce those goods that bring less environmental cost. Government can also implement regulations to overcome the problem of negative externalities and can take direct action to curb them.

6.3.4 Common Property Resources and Tragedy of Commons

A Common property resource also termed as an Open access resources are source that provide benefits to the whole society, but is not owned by any individual or entity. It may include public spaces like parks and natural resources like fish, pastureland, etc. Most often, the terms public property and common property are used synonymously, but they have distinct differences. A Common property resource is different from Public property resource, because it involves the feature of rivalry. That is, one person's use may reduce its availability to others. If anybody can enjoy its use, then there will be a problem of overconsumption, and complete destruction of that resource may happen in nearby by future. That destruction is popularly termed as tragedy of the commons.

The tragedy of the commons is an economic and social problem in which every individual has the in centive to consume a common property at the expense of every other individual, with no way to exclude anyone from consuming. It results in over-consumption, under-investment, and ultimately complete destruction of the resource. As the demand for the resource overwhelms the supply, every individual who consumes an additional unit directly harms others who can no longer enjoy the benefits. Generally, the resource of interest is easily available to all individuals; the tragedy of the commons occurs when individuals neglect the well-being of society in the pursuit of personal gain.

The concept of the tragedy of the commons was technically propounded by Garrett Hardin, an English Environmentalist, in 1968. He had empirical evidence from England. There is some land that people use as pasture for their cattle. Nobody owns so it is open to anyone to come and graze their livestock on the land. Everyone has the right to pasture to graze as many animals as possible, acting in self-interest for the greatest short-term personal gain. Eventually, they use up all the grass in the pasture, and the shared resource is, in the end, depleted and no longer useful. The overuse of common resources such as water, pastures, etc. will bring some economic problems. In which every individual tries to reap the greatest benefit from a given resource. The excessive use of resources will finally lead to the complete depletion of those resources. Here, everyone's properties will be no man's property. Because resources are limited and shared among groups, overgrazing or overfishing may occur.

In short, the term tragedy of the commons states that individuals acting independently and rationally according to theirown self interest behave contrary to the best interest of

the whole group by depleting common resources. Thus, we should take responsibility to carefully utilise natural resources or common property, so as not to produce any harmful effects on humans and living creatures.

Recap

- Public goods are non-rival, non-excludable, indivisible, and for collective satisfaction
- Non-rivalry means there is no scope for rivalry in the consumption of public goods.That is, consumption by one person will not reduce the amount available to others
- Non-excludable means, all persons are included in the consumption of goods
- Another feature of a public good is indivisibility. That is, we cannot divide the public good into small quantities
- Another feature of a public good is that it is for collective satisfaction to attain social welfare
- Environmental quality is a broad term that encompasses various characteristics such as air and water purity or pollution, noise levels, access to common property resources, aesthetics, and their potential effects on physical and mental health.
- Externality is a cost or benefit that occurs in an economy when the production or consumption of a specific good or service affects a third party that is not directly related to the production or consumption of that good or service
- Market failure is the inefficient distribution of goods and services in the market.
- Externalities lead to market failure because a product or service's market price does not accurately reflect the true costs and benefits of that product or service
- The tragedy of the commons is an economic and social problem in which every individual has the incentive to consume a common property at the expense of every other individual, with no way to exclude anyone from consuming
- The concept of the tragedy of the commons was technically propounded by Garrett Hardin, an English Environmentalist, in 1968

Objective Questions

1. What is a key feature of public goods?
2. What is an example of a public good?
3. What is the term for a cost or benefit that affects a third party not directly involved in the production or consumption of a good or service?
4. What type of externality benefits third parties?
5. What is the result of the overconsumption of common property resources?
6. What government intervention can address negative externalities?
7. What is the term for the inefficient distribution of goods and services in the market?
8. What is a characteristic of common property resources?
9. Who propounded the concept of the tragedy of the commons?
10. What is the main reason for market failure in the presence of externalities?

Answers

1. Non-rivalry and non-excludability
2. National defence
3. Externality
4. Positive externality
5. Tragedy of the commons
6. Taxation, subsidies, and regulation
7. Market failure
8. Rivalry in consumption and non-excludability

9. Garrett Hardin

10. Divergence between private and social costs

Assignments

1. Discuss the features of public goods and provide examples.
2. Analyse the concept of externalities and their impact on market efficiency.
3. Explain the tragedy of the commons and its implications for common property resources.
4. Discuss government interventions to address market failure due to externalities.
5. Evaluate the importance of environmental quality as a public good.

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FIFTH SEMESTER BA ECONOMICS EXAMINATION
DISCIPLINE SPECIFIC ELECTIVE - **B21EC04DE DEVELOPMENT ECONOMICS**
(CBCS - UG)
2024-25 - Admission Onwards

Time: 3 Hours Max Marks: 70

SECTION A

Objective Types Questions; Answer **any Ten** (1x 10=10)

1. Name India's policy for rural employment guarantee.
2. Who is known as the father of modern economics?
3. Define sustainable development.
4. Who defined economic development as including both more output and changes in technical and institutional arrangements?
5. Which index adjusts the HDI for inequality in the distribution of health, education, and income?
6. Who coined the phrase demonstration effect?
7. Which development index focuses specifically on gender disparities in health, education, and income?
8. What is the Rio de Janeiro conference known as?
9. Define Infant mortality rate.
10. What is the main focus of the Harrod-Domar Model?
11. What is the key demographic indicator showing children and elderly vs. workers?
12. Who defined economic growth as "a rise in per capita or per worker product over time"?
13. What refers to the widening gap between the richest and poorest countries of the world?
14. Which method compares environmental costs and benefits of projects?
15. Who introduced Inverted U-hypothesis ?

SECTION B

Very Short Answer Questions; answer **any Ten** **(**2x10=20)

16. What are the three core values of development according to Todaro?
17. Distinguish between the terms shocks and stimulants.

18. Mention the components Human Development Index (HDI)?
19. List out the components of Sustainable Development.
20. What are the two key determinants of growth in the Harrod-Domar Model?
21. Write a note on Demographic dividend.
22. What is Effective demand?
23. What are the determinants that affect a country's death rate?
24. Write a note on Lorenz curve.
25. Briefly explain the importance of environmental economics.
26. Differentiate between developed and underdeveloped economies.
27. Write a note on the relationship between economic development and environmental degradation.
28. What is the Gini Coefficient?
29. Give two reasons for market failure.
30. Briefly explain the essential conditions of Balanced Growth.

SECTION C

Short Answer Questions; answer **any five** **(**4x5=20)

31. Explain tragedy of commons.
32. Write a note on Chipko Movement.
33. Explain the characteristics of public goods and private goods.
34. What are the main features of Ricardian theory of economic development?
35. Explain the difference between positive externality and negative externality.
36. Explain the causes of poverty in India.
37. Explain the difference between convergent and divergent series of investment.
38. Discuss the importance of the GDI in assessing gender disparities in human development.
39. What are the benefits of population grow
40. Discuss Low level equilibrium trap.

SECTION D

Long answer Question; Answer **any two** (10x2=20)

41. Explain the Theory of Demographic Transition.
42. Discuss various methods to measure inequality?
43. Describe the concept of development as freedom as proposed by Amartya Sen.
44. Discuss the core assumptions and features of endogenous growth models.

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SET-2

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FIFTH SEMESTER BA ECONOMICS EXAMINATION
DISCIPLINE SPECIFIC ELECTIVE - **B21EC04DE DEVELOPMENT ECONOMICS**
(CBCS - UG)
2024-25 - Admission Onwards

Time: 3 Hours Max Marks: 70

SECTION A

Objective Types Questions; Answer **any Ten** (1x 10=10)

1. Who formulated the unlimited supply of labour hypothesis ?
2. Which economist emphasised the role of learning-by-doing in growth?
3. Name India's umbrella legislation for environmental protection.
4. What does the capital-output ratio indicate?
5. Which economist is known for promoting the concept of development as freedom?
6. What is the main purpose of natural resource accounting in sustainable development?
7. Which development index focuses specifically on gender disparities in health, education, and income?
8. Write an example of public good.
9. Who developed the mathematical formula for optimum population maladjustment?
10. Who formulated the subsistence theory of wages?
11. What is the term for mismatch between education and job requirements?
12. What does self-esteem refer to?
13. Which ratio simply measures the proportion of the population below the poverty line?
14. Who propounded the concept of tragedy of the commons?
15. State any characteristic of underdevelopment?

SECTION B

Very Short Answer Questions; answer **any Ten** **(**2x10=20)

16. Define economic growth and economic development.
17. Explain the concept of dualism. Name different types of dualism.

18. What does Sen's capability approach focus on?
19. Write a note on technological dualism.
20. What is meant by Stationary State, according to Adam Smith?
21. List out the key demographic indicators?
22. State two key determinants of growth in the Harrod-Domar Model?
23. What are the benefits of population growth?
24. Define the poverty line.
25. What are the characteristics of common property resources?
26. What is the difference between relative poverty and absolute poverty?
27. Describe warranted growth rate.
28. What are the various measures of inequality?
29. What are the results of overconsumption of common property resources?
30. Write a note on the Brundtland Commission report.

SECTION C

Short Answer Questions; answer **any five** **(**4x5=20)

31. What are the important constituents of Mill's theory of development?
32. Explain India's progress in achieving Sustainable Development Goals.
33. Write a note on human capital.
34. What is the difference between Naturalism and Optimism.
35. Evaluate the importance of environmental quality as a public good.
36. What are the characteristics of underdeveloped economies?
37. Explain the concept of the Vicious Circle of Poverty.
38. Explain the components of Physical Quality of Life Index (PQLI)?
39. Describe the relationship between population growth and economic development?
40. Explain division of labour according to Adam Smith.

SECTION D

Long answer Question; Answer **any two** (10x2=20)

41. Explain the Optimum Theory of Population.
42. Describe various poverty alleviation programmes launched by government to remove poverty in India.
43. Describe Sen's capability approach and its significance in understanding development.
44. Analyse the concept of externalities and their impact on market efficiency.

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Regional Centres

Kozhikode
Govt. Arts and Science College
Meenchantha, Kozhikode,
Kerala, Pin: 673002
Ph: 04952920228
email: rckdirector@sgou.ac.in

Thalassery
Govt. Brennen College
Dharmadam, Thalassery,
Kannur, Pin: 670106
Ph: 04902990494
email: rctdirector@sgou.ac.in

Tripunithura
Govt. College
Tripunithura, Ernakulam,
Kerala, Pin: 682301
Ph: 04842927436
email: rcedirector@sgou.ac.in

Pattambi
Sree Neelakanta Govt. Sanskrit College
Pattambi, Palakkad,
Kerala, Pin: 679303
Ph: 04662912009
email: rcpdirector@sgou.ac.in

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SGOU

Sreenarayanaguru Open University
Kollam, Kerala Pin- 691601, email: info@sgou.ac.in, www.sgou.ac.in Ph: +91 474 2966841

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