UGC-NET

ECONOMICS

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UGC NET - ECONOMICS

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Growth and Development Economics

Economic Growth and Economic Development

Economics is all about making smart choices to cope with scarcity. The most fundamental measurement used to evaluate the success in allocating the scarce resources is economic growth. Individuals monitor their income and the changing value of their assets. Businesses track their profits and their market share. Nations monitor a variety of statistics to measure economic growth such as national income, productivity etc. Moving beyond growth and productivity, some economists argue that any assessment of the nation's economy must also include measurements of distribution, equity, per-capita income etc. Further, the country should also focus on other needs of a society, like environmental justice or cultural preservation to sustain the economic growth process and allows an overall human development in the economy through creation of more opportunities in the sectors of education, healthcare, employment and the conservation of the environment.

OBJECTIVES

After completing this lesson, you will be able to:

- Define the meaning of Economic Growth and Economic Development, and their differences;
- Explain the concept of Sustainable Development and Human Development;
- List out the factors affecting Economic Growth; and
- Describe the broad Features of the Underdeveloped countries.

Economic growth

The term economic growth is defined as the process whereby the country's real national and per capita income increases over a long period of time.

This definition of economic growth consists of the following features of economic growth-

- Economic Growth implies a process of increase in National Income and Per-Capita Income. The increase in Per-Capita income is the better measure of Economic Growth since it reflects increase in the improvement of living standards of masses.
- Economic Growth is measured by increase in real National Income and not just the increase in money income or the nominal national income. In other words the increase should be in terms of increase of output of goods and services, and not due to a mere increase in the market prices of existing goods.
- Increase in Real Income should be Over a Long Period: The increase of real national income and per-capita income should be sustained over a long period of time. The short-run seasonal or temporary increases in income should not be confused with economic growth.
- Increase in income should be based on Increase in Productive Capacity: Increase in Income can be sustained only when this increase results from some durable increase in productive capacity of the economy like modernization or use of new technology in production, strengthening of infrastructure like transport network, improved electricity generation etc.

ECONOMIC DEVELOPMENT

Economic development is defined as a sustained improvement in material well being of society. Economic development is a wider concept than economic growth. Apart from growth of national income, it includes changes - social, cultural, political as well as economic which contribute to material progress. It contains changes in resource supplies, in the rate of capital formation, in size and composition of population, in technology, skills and efficiency, in institutional and organizational set-up. These changes fulfill the wider objectives of ensuring more equitable income distribution, greater employment and poverty alleviation. In short, economic development is a process consisting of a long chain of interrelated changes in fundamental factors of supply and in the structure of demand, leading to a rise in the net national product of a country in the long run.

The economic growth is a narrow term. It involves increase in output in quantitative terms but economic development includes changes in qualitative terms such as social attitudes and customs along with quantitative growth of output or national income. Economic development without growth is almost inconceivable. The comparison between the two concepts is given in the following table:

COMPARISON CHART: ECONOMIC GROWTH VS. ECONOMIC DEVELOPMENT

	ECONOMIC GROWTH	ECONOMIC DEVELOPMENT
Meaning	Economic growth refers to an increase in the real output of goods and service in the country	Economic development implies changes in income, savings and investment along with progressive changes in socio-economic structure of country (institutional and technological changes)
Factors	Growth relate to a gradual increase in one of the components of Gross Domestic Product: consumption, government spending, investment, net exports.	Development relates to growth of human capital, decrease in inequality figures, and structural changes that improve the quality of life of the population.
Measurement	Economic Growth is measured by quantitative factors such as increase in real GDP or per capita income.	The Qualitative such as HDI (Human development Index), gender- related index, Human Poverty index (HPI), infant mortality, literacy rate etc. are used to measure economic development.
Effect	Economic Growth brings quantitative changes in the economy.	Economic Development leads to qualitative as well as quantitative changes in the economy
Relevance	Economic growth reflects progress in the quality of life in a country.	Economic development reflects progress in the quality of life in a country.

SUSTAINABLE DEVELOPMENT

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development includes the protection of future economic growth and future development. In other words, it means a better quality of life for everyone, now and for generations to come. Sustainable development includes the protection of future economic growth and future development. Growth is essential, but sustainable development requires it to be different. It must become more concerned about the physical environment not only to present generation, but to the future generation also. It means that the current consumption cannot be financed for long by increasing economic debt and ecological imbalance which future generation will pay. Sustainable development constantly seeks to achieve social and economic progress in ways that will not exhaust the earth's finite natural resources. Sustainable development is a process of development in which economic and other policies are designed to bring about development which is economically, socially and ecologically sustainable. The concept thus is pro-people, pro-job and pronature. It gives highest priority to poverty reduction, productive employment, social integration and environmental regeneration.

The sustainable development thus requires

- Preservation of Ecological Resources and greater use of renewable resources.
- Encouragement to the use of environmentally-safe technologies for development purposes i.e. focus on reduction of all kinds of pollution involved in theeconomic activities.
- Formulation and implementation of policy framework for people-security andhuman justice, including ecological and economic security.

HUMAN DEVELOPMENT

According to the United Nation's Development Programme (UNDP), human development may be defined as "a process of enlarging people's choices." At all levels of development, the three essential choices for people include to live a long and healthy life, to acquire better knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not available, many other opportunities to improve the quality of life will remain inaccessible. Human development has two dimensions: acquiring human capabilities and the useof these acquired capabilities for productive, leisure and other purposes. The benefits of human development go far beyond the expansion of income and wealth accumulation because people constitute the very essence of human development. Human development is about much more than economic growth. The economic growth focuses on the improvement of one option i.e. income or product while human development focus on enlarging all human options including education, health, clean environment and material wellbeing. Thus, the options available for improving people's lives are influenced by the quality of economic growth in its wider sense, and the impact is by no means confined to quantitative aspects of such growth. In other words, economic growth needs to be seen as a means, albeit an important one, and not the ultimate goal, of development. Income makes an important contribution to human well-being, broadly conceived, if its benefits are translated into more fulfilled human lives. But the growth of income is not an end in itself. It is the quality of growth, not its quantity alone, which is crucial for human well-being.

Thus, the concept of human development, is concerned mainly with enabling people to enjoy a better life as the ultimate goal of human endeavor. Highlights that this goal cannot be achieved solely through improvements in income or material well-being.

As the 1996 Human Development Report put it, growth can be jobless, rather than job creating; ruthless, rather than poverty-reducing; voiceless, rather than participatory, rootless, rather than culturally enshrined; and futureless, rather than environment-friendly. Economic growth which is jobless, ruthless, voiceless, rootless and futureless is not conducive to human development. The lack of income or income poverty is only one aspect of human impoverishment; deprivation can also occur in other areas having a short and unhealthy life, being illiterate or not allowed to participate, feeling personal insecurity, etc. Human poverty is thus larger than income poverty.

MEASURING HUMAN DEVELOPMENT: HUMANDEVELOPMENT INDEX (HDI)

As stated earlier three dimensions of Human Development are capabilities of people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. The combined effect of various components of human development is measured through Human Development Index (HDI). The HDI contains four variables: life expectancy at birth, to represent the dimension of a long, healthy life; adult literacy rate and combined enrolment rate at the primary, secondary and tertiary levels to represent the knowledge dimension; and real GDP per capita to serve as a proxy for the resources needed for a decent standard of living. HDI thus looks not only at GDPgrowth rate but takes into account education, health, gender inequality and income parameters to measure human development of a country.

As per the latest available Human Development Report (HDR) 2013 published by the United Nations Development Programme (UNDP) (which estimates the human development index [HDI) in terms of three basic capabilities: to live a long and healthy life, to be educated and knowledgeable, and to enjoy a decent economic standard of living), the HDI for India was 0.554 in 2012 with an overall global ranking of 136 (out of 186 countries) compared to 134 (out of 187 countries) as per HDR 2012. India's HDI has risen by 1.7% annually since 1980.

FACTORS AFFECTING ECONOMIC GROWTH

The process of economic growth is a highly complex phenomenon and is influenced by numerous and varied factors such as political, social and cultural factors. These factors are as follows:

A. Economic Factors

1. Natural Resources

The principal factor affecting the development of aneconomy is the natural resources. The natural resources include the land area and the quality of the soil, forest wealth, good river system, minerals and oil resources, good climate, etc. For economic growth, the existence of natural resources in abundance is essential. A country deficient in natural resources may not be in a position to develop rapidly. However, the availability of rich natural resources are a necessary condition for economic growth but not a sufficient one. In less developed countries, natural resources are unutilized, underutilized or misutilised. This is one of the

reasons of their backwardness. On the otherhand countries such as Japan, Singapore etc. are not endowed with abundant natural resources but they are among the developed nations of the world. These countries have shown committment towards preserving the available resources, putting best efforts to manage the resources, minimizingwaste of resources etc.

2. **Capital Formation**

Capital formation is another important factor fordevelopment of an economy. Capital formation is the process by which a community's savings are channelised into investments in capital goods such as plant, equipment and machinery that increases nation's productive capacity and worker's efficiency thus ensuring a larger flow of goods and services in acountry. The process of capital formation implies that a community does not spend whole of its income on goods for current consumption, but saves a part of it and uses it to produce or acquire capital goods that greatly add to productive capacity of the nation. Technological Progress: Technological progress is a very important factor in determining the rate of economic growth. Technological progress mainly implies the research into the use of new and better methods of production or the improvement of the old methods. Sometimes technical progress results in the availability of natural resources. But generally technological progress results in increase in productivity. In other words, technological progress increases the ability to make a more effective and fruitful use of natural and other resources for increasing production. By the use of improved technology it is possible to have greater output from the use of given resources or a given output can be obtained by the use of a smaller quantity of resources. The technological progress improves an ability to make a fuller use of the natural resourcese.g, with the aid of power-driven farm equipment a marked increase has been brought about in agricultural production. The USA, UK, France, Japan and other advanced industrial nations have all acquired the industrial strength from use of advanced technology. In fact economic development is facilitated with the adoption of new techniques of production.

3. **Entrepreneurship**

Entrepreneurship implies an ability to find out new investment opportunities, willingness to take risks and make investment in the new and growing business units. Most of the underdeveloped countries in the world are poor not because there is shortage of capital, weak infrastructure, unskilled labor and deficiency of natural resources, but because of acute deficiency of entrepreneurship. It is, therefore, essential in the under-developed nations to create climate for promoting entrepreneurship by emphasizing education, new researches, andscientific and technological developments.

4. **Human Resources Development**

A good quality of population is veryimportant in determining the level of economic growth. So the investment in human capital in the form of educational and medical and such other social schemes is very much desirable. Human resource development increases the knowledge, the skills and the capabilities of the people that increase their productivity.

5. **Population Growth**
   Labor supply comes from population growth and it provides expanding market for goods and services. Thus, more labor produces larger output which a wider market absorbs. In this process, output, income and employment keep on rising and economic growth improves. But the population growth should be normal. A galloping rise in population retardseconomic progress. Population growth is desirable only in a under-populated country. It is, however, unwarranted in an overpopulated country like India.

6. **Social Overheads**
   Another important determinant of economic growth is the provision of social overheads like schools, colleges, technical institutions, medical colleges, hospitals and public health facilities. Such facilities make the working population healthy, efficient and responsible. Such people can well take their country economically forward.

Non-Economic Factors

Non-Economic factors that include socio-economic, cultural, psychological and political factors are also equally significant as are economic factors in economic development. We discuss here some of the essential non economic factors which determine the economic growth of an economy.

1. **Political Factors**
   Political stability and strong administration are essentialand helpful in modern economic growth. The stable, strong and efficient government, honest administration, transparent policies and their efficient implementation develop confidence of investors and attracts domestic as wellas foreign capital that leads to faster economic development.

2. **Social and Psychological Factors**
   Social factors include social attitudes,social values and social institutions which change with the expansion of education and transformation of culture from one society to the other. The modern ideology, values, and attitudes bring new discoveries and innovations and consequently to the rise of the new entrepreneurs. The outdated social customs restricts occupational and geographical mobility and thus pose an obstacle to the economic development.

3. **Education**
   It is now fairly recognized that education is the main vehicle of development. Greater progress has been achieved in those countries, where education is widespread. Education plays an important role in human resource development, improves labor efficiency and removes mental block to new ideas and knowledge thus contributes to economic development.

4. **Desire for Material Betterment**
   The desire for material progress is a necessary precondition for economic development. The societies that focus on self-satisfaction, self-denial, faith in fate etc. limit risk and enterprise and thus keep the economy backward.

COMMON FEATURES OF UNDERDEVELOPEDCOUNTRIES

1. Low per Capita Income: The level of per capita income is very low inunderdeveloped countries.
2. Poor Level of Living: The vast majority of people in underdeveloped nationslie under the conditions of poverty, malnutrition, disease, illiteracy, etc. Even basic necessities of life such as minimum food clothing and shelter are noteasily accessible to the poor masses.
3. High Rate of Growth of Population: Population growth in underdevelopedcountries neutralizes economic growth. High population implies greater consumption expenditure and lower investments in productive activities andslows down the economic development.
4. Highly Unequal Income Distribution: The income inequality between therich and the poor people within the underdeveloped countries is also very high.
5. Prevalence of Mass Poverty: Low level of per capita income combined withhigh degree of inequalities in its distribution leads to widespread poverty inunderdeveloped countries.
6. Low Levels of Productivity: The Productivity level (i.e. output produced perperson) tends to be very low in an underdeveloped country which is mainly due to:
   (i) Inefficient workforce which itself is a consequence of poverty, ill health and lack of education
   (ii) Low work culture
   (iii) Low use of capita inthe form of machinery and equipment.
7. Low Rate of Capital Formation: The saving rate in an underdevelopedcountry is quite low and rate of capital formation is also is very slow.
8. Technological Backwardness: In most of the sectors, an underdevelopedeconomy the techniques of production employed are generally obsolete mainlydue to low saving rate.
9. High Level of Unemployment: Unemployment levels are very high in theunderdeveloped countries mainly due to lack of capital and low level of development in various economic sectors, these countries are not able toabsorb the rising labor supply.
10. Low Social Indicators of Development: The under-developed countrieshave very low social indicators such as low literacy rate, high infant mortality rate, low expectancy of life, etc. as compared to the developed countries.

Theories of Economic Development

Adam Smith

Adam Smith is considered to be the father of economics. It is not so because he was first explorer in the field of economics, also not because he revolutionized economic planning by his maiden ideas, but because he abbreviated what he had received from his predecessors and handed it down as a guide to the coming generations.

He was the editor and not the author, organizer and not the originator of economic science.

"He was the man of systematic work and balanced presentation, not of great new ideas but a man who carefully investigates the given data, criticizes them cooly and sensibly, and coordinates the judgements arrived at with others which have already been established".

Adam Smith contained all his ideas in his "Wealth of Nations". The most important aspect of this book was a Theory of Economic Development. Physiocracy came into existence due to mercantilism. They believed in science of natural laws and emphasised the significance of agriculture and contended that it is the only industry that can make country wealthy. Adam Smith's 'Wealth of Nations' was scientific not because it contained the absolute truth but because it came as a turning point, the beginning of all that came after, as it was the end of all that came before.

The main points of the theory are as under

Natural Law

Adam Smith proposes natural law in economic affairs. He advocated the philosophy of free and independent action. If every individual member of society is left to peruse his economic activity, he will maximize the output to the best of his ability. Freedom of action brings out the best of an individual which increases society wealth and progress. Adam Smith opposed any government intervention in industry and commerce.

He was a staunch free trader and advocated the policy of Laissez-Faire in economic affairs. He opines that natural laws are superior to law of states. Statutory law or manmade law can never be perfect and beneficial for the society that is why Smith respects nature's law because nature is just and moral. Nature teaches man the lesson of morality and honesty. These exercise favourable effects on the economic progress of society.

Laissez Faire

Adam Smith's theory is based on the principle of 'Laissez-Faire' which requires that state should not impose any restriction on freedom of an individual. The theory of economic development rests on the pillars of saving, division of labour and wide extent of market. Saving or capital accumulation is the starting point of this theory. He believed that "there is a set of rules or rights of justice and perhaps even of morality in general which are, or may be known by all men by hello either or reason or of a moral sense, and which possesses an authority superior to that of such commands of human sovereigns and such customary legal and moral regulations as may contravene them".

The policy of laissez-faire allows the producers to produce as much they like, earn as much income as they can and save as much they like. Adam Smith believed that it is safe to leave the economy to be propelled, regulated and controlled by invisible hand i.e. the forces of competition motivated by self interest be allowed to play their part in minimizing the volume of savings for development.

Production Function -

Adam Smith recognized three factors of production namely labour, capital and land i.e.

Y = f (K, L, N)

K = Stock of Capital

L = Labour force

N = Land

He emphasized labour as an important factor of production along with other factors and observed, “The annual labour of nation is the fund which originally supplies it with all necessaries and conveniences of life which it annually consumes and which consists always either in immediate produce from other nations”. Since the growth is a function of capital, labour, land and technology and land being passive element is least important. Prof. Adam Smith regarded labour as father and land as mother. He wrote, “To him (farmer) land is the only instrument which enables him to earn the wages of his labour and to make profits of this stock”.

The production function does not conceive the possibility of diminishing marginal productivity. It is subject to law of increasing returns to scale. Smith argued that real cost of production shall tend to diminish with the passage of time, as a result the existence of internal and external economies occurring out of the increases in market size.

Adam Smith asserted that division of labour does not depend merely on technological feasibility, it greatly depends on the extent of the market as well and the size of market depends on the available stock and the institutional restrictions placed upon both domestic and international trade. Smith observes that, “when the market is small, no person can have encouragement to dedicate himself entirely to one employment, for want of power to exchange all the surplus part of production of his own labour, which is over and above his own consumption, for such parts of the produce of other man’s labour as he has occasion for”.

Smith also recognizes the importance of technological development for improvement in productivity and which is possible only if sufficient capital is available. He wrote, “The person who employs his stock in maintaining labour, endeavors, therefore, both to make among his workmen the most proper distribution of employment and furnish them with the best machines which he can either invent or afford to purchase. His ambition in both these respects is generally in proportion to the extent of his stock or to the number of people which it can employ”.

Division of Labour

The rate of economic growth is determined by the size of productive labour and productivity of labour. The productivity of labour depends upon technological progress of a country and which, in turn, depends upon the division of labour. This division of labour becomes the true dynamic force in Adam Smith's theory of growth. The only remarkable feature of Smith's account of division of labour is pointed by Prof.

Schumpeter as "nobody, either before or after Adam Smith ever thought of putting such a burden upon division of labour. With Adam Smith it is practically the only factor in economic progress".

Division of labour increases the productivity of labour through specialization of tasks. When a work is sub-divided into various parts and the worker is asked to perform small parts of whole job, his efficiency increases as now he can focus his attention more carefully. Thus, the concept of division of labour means the transference of a complex production process into number of simpler process in order to facilitate the introduction of various methods of production.

Adam Smith concentrated upon the social division of labour which emphasized the co-operation of all for satisfaction of the desires of each. It is the process by which different types of labour which produce goods to satisfy the individual needs of their producers are transformed into social labour which produces goods for exchanging them for other goods.

Adam Smith in his book 'Wealth of Nations' pointed out three benefits of division of labour -
1. Increase of dexterity of workers.
2. Saving time required to produce commodity.
3. Invention of better machines and equipment.

The third advantage implies that invention is the result of worker's intelligence. But Smith wrote that workers become 'as stupid and ignorant as it is possible for human creature to become as a result of division of labour'. Division of labour necessarily leads to exchange of goods, which highlights the importance of trade. In short, division of labour leads to exchange of goods which, in turn, promotes trade and widens the extent of market. Wide extent of market is an essential pre- requisite for economic development.

Capital Accumulation -

It is the pivot around which the theory of economic development revolves. The growth is functionally related to rate of investment. According to Smith, "any increase in capital stock in a country generally leads to more than proportionate increase in output on account of continually growing division of labour".

Capital stock consists of -
(a) Goods for the maintenance of productive workers.
(b) Goods for helping the workers in their productive activities.

Adam Smith distinguished between non capital, circulating capital and fixed capital goods. Non capital goods refer to those which are useful directly and immediately to their owner. Fixed capital refers to those goods which are directly used in production processes, without changing hands. Fixed capital consists of all the means of production.

Capital is increased by parsimony and diminished by prodigality and misconduct. The rate of investment was determined by the rate of saving and savings were invested in full. The classical economists also believed in the existence of wage fund. The idea is that wages tend to equal to the amount necessary for the subsistence of labourers.

If the total wages at any time become higher than subsistence level, the labour force will increase, competition for employment will become keener and the wages come down to the subsistence level. Thus, Smith believed that, "under stationary conditions, wage rate falls to the subsistence level, whereas in periods of rapid capital accumulation, they rise above this level. The extent to which they rise depends upon the rate of population growth". Thus, it can be concluded that wage fund could be raised by increasing the rate of net investment.

According to Smith, "investments are made because the capitalist want to earn profits on them. When a country develops and its capital stock expands, the rate of profit declines. The increasing competition among capitalists raises wages and tends to lower profits". So it is a great difficulty of finding new profitable investment outlets that leads to falling profits.

Regarding the role of interest, Smith postulated a negatively sloped supply curve of capital implying that supply of capital increased in response to decline in interest rate. Smith wrote that with the increase in prosperity, progress and population, the rate of interest falls and as a result, capital is augmented. With the fall in interest rate, the money lenders will lend more to earn more interest for the purpose of maintaining their standard of living at the previous level.

Thus, the quantity of capital for lending will increase with the fall in rate of interest. But when the rate of interest falls considerably, the money lenders are unable to lend more in order to earn more to maintain their standard of living. Under these circumstances, they will themselves start investing and become entrepreneurs. Smith believed that economic progress-involves rise in money as well as real rentals, and a rise in rental share of national income. This is because the interest of land owners is closely related to general interest of the society.

Agents of Growth -

Smith has observed that farmers, producers and businessmen are the important agents of economic growth. It was the free trade, enterprise and competition that led farmers, producers and businessmen to expand the market and which, in turn, made the economic development inter-related. The development of agriculture leads to increase in construction works and commerce. When agricultural surplus arises as a result of economic development, the demand for commercial services and manufactured articles arises.

This leads to commercial progress and establishment of manufacturing industries. On the other hand, their development leads to increase in agricultural production when farmers use advanced techniques. Thus, capital accumulation and economic development take place due to the emergence of the farmer, the producer and the businessmen.

Process of Growth

"Taking institutional, political and natural factors for granted, Smith starts from the assumption that a social group may call it a 'nation' will experience a certain rate of economic growth that is accounted for by increase in numbers and by savings. This induces a widening of market which, in turn, increases division of labour and thus, increases productivity. In this theory, the economy grows like a tree. This process is no doubt exposed to disturbances by external factors that are not economic… but in itself, it proceeds continuously and steadily.

Each situation grows out of preceding one in a uniquely determined way and the individuals whose act combine to produce each situation count individually for no more than the individual cells of a tree". The process of growth is cumulative. Division of labour made possible by accumulation of capital and expansion of market, increases national income and output, which in turn, facilitates saving and further investment and in this way, economic development rises higher and higher. Smith's progressive state is in reality the cheerful and hearty state to all the different orders to the society. But this progressive state is not endless. It ultimately leads to stationary state.

It is the scarcity of natural resources that stops growth. An economy in stationary state is characterized by unchanged population, constant total income, and subsistence wage, elimination of profit in excess of the minimum consistent with risk and absence of net investment. In his opinion, an economy is stationary state finds itself at the highest level of prosperity consistent with its natural resources and environment.

The competition for employment reduces wages to subsistence level and competition among the businessmen brings profits as low as possible. Once profit falls, it continues to fall. Investment also starts declining and in this way, the end results of capitalist is stationary state.
When this happens, capital accumulation stops, population becomes stationary, profits are minimum, wages are at subsistence level, there is no change in per capita income and production and the economy reaches the state of stagnation. The stationary state is dull, declining, melancholy life is hard in stationary state for different sections of the society and miserable in declining state. Smith's theory is explained with the help of a diagram 1.

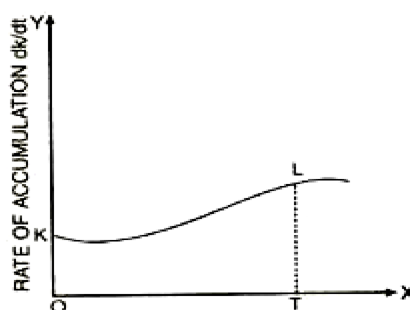

Fig. 1

Time is taken along the X-axis and the rate of accumulation along the Y-axis. The economy grows from K to L during the time path T. After T, the economy reaches stationary state. Linked to L where further growth does not take place because wages rise so high that profits become zero and capital accumulation stops.

Conclusion

It can be concluded that Prof. Adam Smith did not propound any specific growth theory. His views relating to economic development are part of general economic principle propounded by him. R. Lekachaman says, "A good deal of Smith's analysis reads as though written with todays UDC's in mind". In a very important aspect then this book (Wealth of Nations) was the theory of economic development.

Ricardo

Economics as a science is, on the one hand, a body of knowledge and on the other hand, an engine of analysis.

As a result of knowledge, it contains generalizations about the working of economic system. Prof. Ricardo added little to the economic knowledge gathered by Smith.

As an analytical engine, economics provides an apparatus through which actual economic problems are analyzed.

Ricardo's greatest contribution to economics is the provision of engine of analysis. By using the technique of deductive or abstract reasoning, he constructed a rigorous model in which some selected economic variables were systematically placed to form a logic. Such a theoretical model helps to understand how a system works and how the change in variables affects the working of the system.

Ricardo propounded no theory of development. He simply discussed the theory of distribution. This theory is based on the marginal and surplus principles. The marginal principle explains the share of rent in national output and surplus principle explains the division of the remaining share between wages and profits.

Assumptions

The Ricardian theory is based on certain assumptions which are as under:

1. Supply of land is fixed.
2. Land is used for production of corn and the working force in agriculture helps in determining the distribution in industry.
3. Law of diminishing returns operates on land.
4. Demand for corn is perfectly inelastic.
5. Labour and capital are variable inputs.
6. Capital consists of circulating capital.
7. There is capital homogeneity.
8. All workers are paid subsistence wages.
9. The state of technological knowledge is given.

10. There is perfect competition.
11. Demand for labour depends upon accumulation of capital.
12. Demand and supply price are independent of the marginal productivity of labour.
13. The supply price of labour is given and constant.
14. Capital accumulation results from profits.

Ricardian system considers agriculture as the most important sector of the economy. The difficulty of providing food to expanding population is the main problem. According to Ricardo, there are three major groups in the economy. They are landlords, capitalists and labourers among whom the entire productive land is distributed. It is the capitalists who initiate the process of economic development in the society by reinvesting profits and, thus, increasing capital formation.

The total national output is distributed among the three groups as rents, profits and wages, respectively and the share of each group can be determined as under:

1. Rent per unit of labour is the difference between average and marginal product or total rent equals the difference between average product and marginal product multiplied by the quantity of labour and capital on land.
2. The wage rate is determined by wage fund divided by number of workers employed at subsistence wage. Thus, output of total corn produced and sold, rent has the first right and the residual is distributed among wages and profits, while interest is included in profits.

Production Function -
Ricardo's production function assumes the existence of three factors-land, labour and capital and it is subjected to the restriction of diminishing marginal productivity due to perfectly inelastic of land and its variable quality He regarded economic development as the process of these factors of production. The marginal productivity of land, labour and capital declines with the increase in cultivation.

In agriculture, the rate of innovation introduced would be insufficient to affect the tendency for diminishing returns to set in at either intensive or extensive margin of cultivation. Thus, the introduction of improvements in the agriculture techniques might check the progress of diminishing returns it could have temporary effect on cost of agricultural production.

For the overall growth of the economy, it is necessary to examine as to which of these patterns prevail with respect to the output of industry and agriculture together. Ricardo is of the opinion that "Although, then it is probable that under the most favourable circumstances, the power of production is still greater than that of population, it will not long continue so, for the land being limited in quantity and differing in quality, with every increased portion of capital employed on it there will be a decreased rate of production while the power of population continues always to be the same". As Smithian economy grows at an accelerated rate, Ricardian economy develops at a progressively slower pace.

Ricardian production function is given as -
Y = F (K ,N,L)
K = Capital
N = Labour
L = Land

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This production function is subjected to following constraints imposed by diminishing marginal productivity –

$$\frac{\partial^2 F}{\partial K^2} < O \frac{\partial^2 F}{\partial N^2} < O \frac{\partial^2 F}{\partial L^2} < O$$

Since the pace of economy's technological progress Regulated to a large extent the rate of onset of diminishing returns, we many write,

$$\frac{\partial^2 \mathbf{F}}{\partial \mathbf{K}^2} = \mathbf{g}\left(\frac{\mathbf{ds}}{\mathbf{dt}}......\right)$$

$$\frac{\partial^2 \mathbf{F}}{\partial \mathbf{N}^2} = \mathbf{h}\left(\frac{\mathbf{ds}}{\mathbf{dt}}......\right)$$

$$\frac{\partial^2 \mathbf{F}}{\partial \mathbf{L}^2} = \mathbf{j}\left(\frac{\mathbf{ds}}{\mathbf{dt}}......\right)$$

Since ds/dt is one of the determinants of the extent of diminishing returns, it must also appear as a determinant of marginal productivity of the factors of production themselves. To simplify the calculations, we may introduce S in the production function i.e.

$$\mathbf{Y} = \mathbf{f}\left(\mathbf{K}, \mathbf{L}, \mathbf{N}, \mathbf{S}\right)$$

The rate of progress of the economy is obtained by differentiating the above Equation

$$\frac{dy}{dt} = \frac{\partial F}{\partial K}.\frac{dK}{dt} + \frac{\partial F}{\partial L}.\frac{dL}{dt} + \frac{\partial F}{\partial N}.\frac{dN}{dt} + \frac{\partial F}{ds}.\frac{dS}{dt}$$

$\frac{dK}{dt} \rightarrow$ Capital accumulation

$\frac{dN}{dt} \rightarrow$ Land increases

Capital Accumulation

Ricardo emphasized the rate of capital accumulation as capital acts as an engine of growth. "Capital" is the part of the wealth of a country which is employed in production and consists of food, clothing tools, raw materials, machinery etc., necessary to give effect to labour.

Capital accumulation depends upon two factors -
(a) Capacity to save.
(b) Will to save.