UNIT 1 ECONOMIC GROWTH: CONCEPTS AND MEASUREMENT*

Structure

1.0 OBJECTIVES

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

- define the concept of economic growth;
- distinguish between economic growth and economic development;
- write a note on the different types of growths used in empirical works;
- explain the importance of studying the process of economic growth;
- discuss the sources of economic growth; and
- outline the limitations of focusing only on economic growth.

1.1 INTRODUCTION

If you speak to your parents and grandparents about their life when they were young, you will find that your standard of life is much higher than theirs. The material standards of living have substantially improved for most of the people in

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the last few decades in most countries. This improvement in standard of living has come about from the rising levels of incomes. This has made it possible for people to consume higher quantities of goods and services as well as of better quality.

This course explains how economic theory is useful to better understand the process of economic growth and change. There are no universal laws which govern the process of economic growth. But there are many economies that face a relatively small set of dominating constraints in their process of growth and structural change. Economics by itself cannot offer a satisfactory explanation of either particular historical experiences or some general phenomena such as technical progress. But it can offer valuable insights into the fundamental process of growth in these economies.

Paul Romer (1996) explains the process of economic growth using an interesting analogy. He says, '*Economic growth occurs whenever economic agents take resources and rearrange them in ways that are more valuable. A useful metaphor for production in an economy comes from the kitchen. To create valuable final products, we mix inexpensive ingredients together according to a recipe. The cooking one can do is limited by the supply of ingredients, and most cooking in the economy produces undesirable side effects. If economic growth could be achieved only by doing more and more of the same kind of cooking, we would eventually run out of raw materials and suffer from unacceptable levels of pollution and nuisance. Human history teaches us, however, that economic growth springs from better recipes, not just from more cooking. New recipes generally produce fewer unpleasant side effects and generate more economic value per unit of raw material*'. If no new recipes or ideas were discovered, each successive generation tends to approach the limits to growth that finite resources and the undesirable side effects from its consumption would yield. But every generation also underestimates the potential for finding new recipes and ideas. Human beings consistently fail to grasp how many more ideas are yet to be discovered. Possibilities do not merely add up, but multiply with time and people as they interact.

1.2 WHAT IS ECONOMIC GROWTH?

In simple words, 'economic growth' occurs whenever people take resources and rearrange them in ways that are more valuable to the society. Economic growth may therefore be defined as a 'rate of expansion that can move an underdeveloped country from a near subsistence mode of living to substantially higher levels in a comparatively short period of time'. This means that such a transformation should happen in decades rather than centuries. Historically, rapid economic growth has been accompanied by greater industrialization. Hence, more precisely, the process of economic growth can be described as greater commercialisation of economic activities.

It follows therefore that a simple formal definition of economic growth is that 'it is an increase in the level of output of goods and services that is sustained over a long period of time and one that is measured in terms of value added'. The process of economic growth is essentially a dynamic concept as it refers to a continuous expansion in the level of output. This means that it refers to forces that generate a positive rate of change over time. It does not merely refer to the forces that lead to discrete (or one shot) change from a lower to higher level of output which are temporary and short-lived.

The term 'output expansion' means that growth in total output in 'per capita terms'. An increase in the former is referred to as 'extensive growth' whereas an increase in the latter is called the 'intensive growth'. The latter one is important in the context of increase in the standard of living of the population subsisting in the lower rungs of the country. The former is significant when one wants to examine the aggregative phenomenon like economies of scale.

A distinction can be made between level of output and output capacity. Most growth theories implicitly deal with the changes in output capacity. But actual changes in output over time are influenced by the ability of an economy to utilize the existing capacity effectively. It must therefore be kept in mind that for an economy, growth of output at two points of time may be influenced by different degrees of utilization of capacity. Thus, in the long term analysis, one cannot ignore the effects of the short run completely.

Another important issue in the context of growth process is the incorporation of the changes in the quality. This is an integral part of the growth process since both the Factor and the Commodity markets are characterized by these changes.

For instance, in the commodity markets, economic growth leads to not only increased output but also to newer and better products. In the factor markets, economic growth brings improvements in skills of workforce. This can be due to the more efficient and safer types of machinery. The process of economic growth may also lead to changes in the form of economic activities. This is referred to as a structural shift in the economy. This means that the economy moves away from being largely rural and agriculture based to urban and industry based. The most fundamental change that economic growth has by far created is the widening of the range of choices that become available in an economy. Economic growth creates the potential for the society to usher-in healthier and better educated population. It thereby improves the quality of life for people.

1.3 DISTINCTION BETWEEN ECONOMIC GROWTH AND DEVELOPMENT

The term *economic growth* refers to sustained increases over time in a country's real output of goods and services. The term 'real output' means it is value added or 'output minus inputs'. Such output is generally measured by gross or net domestic product (GDP or NDP). The term *economic development*, in contrast, is much more comprehensive. It implies progressive changes in the socio-economic structure of a country. Viewed in this way, economic development involves a steady decline in agriculture's share in the GDP and a corresponding rise in the share of industrial and the services sector. Such a transformation in the economic structure is invariably accompanied by a shift in the (i) occupational structure of labour force and (ii) an improvement in its skill and productivity. Hence, compared to the objective of development, economic growth is far easier to realise. In other words, the process of development is far more pervasive. This is because, apart from a rise in output, it involves changes in (i) the composition of output as well as (ii) a shift in the allocation of productive resources to ensure social justice.

Many a times, we tend to use growth and development interchangeably. A growth in the real income is supposed to contribute to an overall increase in the standard of living of the people in general. Hence, while growth is necessary for development, it is not sufficient for development. The average per capita income figures are derived by dividing the total real income by the total population of the

country. But it does not say anything about the distribution of income, occupational structure, share of agriculture and industry, etc.

Check Your Progress 1

1) How is 'economic growth' defined in simple terms? What does it mean?

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2) How is the term 'economic growth' alternatively, and more formally, defined? In what way does it make the concept dynamic?

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3) How are the terms 'extensive growth' and 'intensive growth' defined?

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4) What is meant by a 'structural shift' in an economy?

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5) How is economic development different from economic growth? What are the two features of the economy which is usually accompanied with economic development?

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1.4 DISTINCTION BETWEEN DIFFERENT TYPES OF GROWTHS

Growth is related to change in the value of a variable. If the variable is GDP, then it relates to economic growth. If it is related to population, then it is population growth. It is always expressed as a percentage. For its calculation, we need minimum two values: one for the base year and one for the year up to which we want to calculate the growth rate. When the growth rate depends only on the two values, the base year value and the terminal year value, it is called as the Average Annual Growth Rate (AAGR). Note the word 'average'. If we are calculating the growth rate of the economy between 1975 and 2020, it is the average growth rate for the 45 years (taken as *n* for number of years in the period) but based only on the initial year's value for 1975 and the terminal year's value for 2020. The AAGR is Compound Annual Growth Rate (CAGR) when it is calculated by using the logarithmic values of the base and the terminal year values. If we have data for all the years in a time series, we can estimate the growth rate by fitting a 'trend line'. We will see the specific difference in these approaches in this section.

(a) Growth and Change

Let x be an economic variable. Let x_0 be its initial value and x_1 be its subsequent value. Now, the 'proportional change' in reaching x_1 from x_0 is given by:

$$\frac{x_1 - x_0}{x_0} = \frac{\Delta x}{x_0}$$

For expressing the measure of growth as the 'growth rate', the proportional change is multiplied by 100 i.e. 100 * ($\Delta x/x_0$). You must note that if x is itself in

percentage, it then becomes tricky. For instance, if unemployment decreases from 15% to 12%, it is a reduction of 3 percentage points. But $\frac{15-12}{15}\times 100 = \frac{\cancel{3}}{\cancel{15}_{5}}\times \cancel{100} = 20\%$. Hence, we must have the values for the base year and the terminal year in their absolute numbers and not in percentages.

(b) Types of Growth Rate

When we have data for more than one point of time or year, we need a formula to calculate the growth rate. We may have the values only for the two terminal years of the period or for more time points. Let us say, y_0 is the income in the initial year, there are n number of years and we have to find out, r the average annual rate of growth. If income in the year t is given by y_t, then we have the relationship between y_0 and y_t expressed as: $y_t = y_o\ (1+r)^n$. Taking log (or logarithm) on both sides of this, we get:

$$\log y_t = \log y_o + n \log (1+r)$$

$$\therefore \log (1+ r) = \frac{\log y_t - \log y_o}{n} = \frac{\log (y_t/y_o)}{n}$$

$$\text{Hence, } 1+ r = \text{antilog}\left[\log \frac{(y_t / y_o)}{n}\right]$$

$$\therefore \quad r = \left\{anti\log\left[\frac{\log(y_t / y_o)}{n}\right] - 1\right\}$$

The above assumes constant rate of growth (r.o.g). When the r.o.g is not constant, then for a series of values like

$x_1, x_2, ...x_i.....x_t$ in t=1,2,.....i,.....t

then $r = (x_1, x_2, ...x_t)^{1/t}$

Here, r is the geometric mean of the values x_1, x_2, ...,x_t. As an illustration, let us consider estimating the population growth as follows.

$$\frac{dp}{dt}\cdot\frac{1}{p} = \frac{dp/dt}{p}$$

Here, $\frac{dp}{dt}$ is called as the 'absolute growth rate'. The term on the LHS i.e. $\frac{dp}{dt}/p$ is called as the 'relative growth rate'. There are two other types of growth

viz. the arithmetic growth and the geometric growth. In the arithmetic growth (also called the simple growth), the growth is by a constant amount in each time period. In the geometric growth (called the exponential growth), growth between any two periods is same but by a constant proportion of value. Note that when we have values in an annual time series, a linear trend relationship can be fitted for the data. The form of the equation in its linear form would be of the type:

$$y = \alpha + \beta T + \mu \qquad (1)$$

where *T* indicates time taken in years (taken chronologically as 1, 2, 3, ... for the different years in the series) and μ is the error or the disturbance term. In equation (1), *y* is the value of the principal variable for which we are calculating the growth rate (e.g. population, GDP). In order to arrive at an estimate of *g*, the growth rate, we need to express the value of *y* in their logarithm. For a constant growth series, we have the equation in the form:

$$y_t = y_0(1+g)^t \qquad (2)$$

where g = $\frac{(y_t - y_{t-1})}{y_{t-1}}$ is the constant proportionate rate of growth per period. Taking log on both sides of (2) we get:

$$\ln y = \alpha + \beta t \qquad (3)$$

where $\alpha = \ln y_0$ and $\beta = \ln(1+g)$. If one suspects that a series has a constant growth rate, plotting the log of the series against time provides a quick check. If the series is approximately linear, an equation of the type (3) can be fitted by the method of least squares. In this method, we regress the log values of *y* on *t*, the year, taken in chronological order like 1, 2, 3, ... The resultant slope coefficient then provides an estimate of *g*, as $\hat{g}$ or *b* = $\ln(1+\hat{g})$ where $\hat{g}$ = e^b-1.

The β coefficient in (1) represents the continuous rate of change i.e. $\partial \ln y_t / \partial t$, whereas the *g* in (2) represents its discrete case. Note that if we take the first difference in log, we get the 'continuous growth rate' which is an approximation to the 'discrete growth rate'. This approximation is reasonably accurate for small values of *g*. Note also that the 'geometric mean growth rate' is the same as the 'compound growth rate'. In order to verify this, let v_o be the value of the variable in year 0 (the first year), v_t be the value of the variable in the year *t* and *g* be the compound average annual growth rate. Then from

$$v_t = v_o(1+g)^t$$

$$\Rightarrow g = \left(\frac{v_t}{v_o}\right)^{1/t} - 1$$

Note that if the growth rate is continuously compounded, then we get:

$$v_o e^{gt} = v_t$$

$$e^{gt} = \frac{v_t}{v_o}$$

$$g = \frac{1}{t}\ln\left(\frac{v_t}{v_o}\right)$$

Thus, the geometric mean growth rate is the same as the compound growth rate.

1.5 IMPORTANCE OF ECONOMIC GROWTH

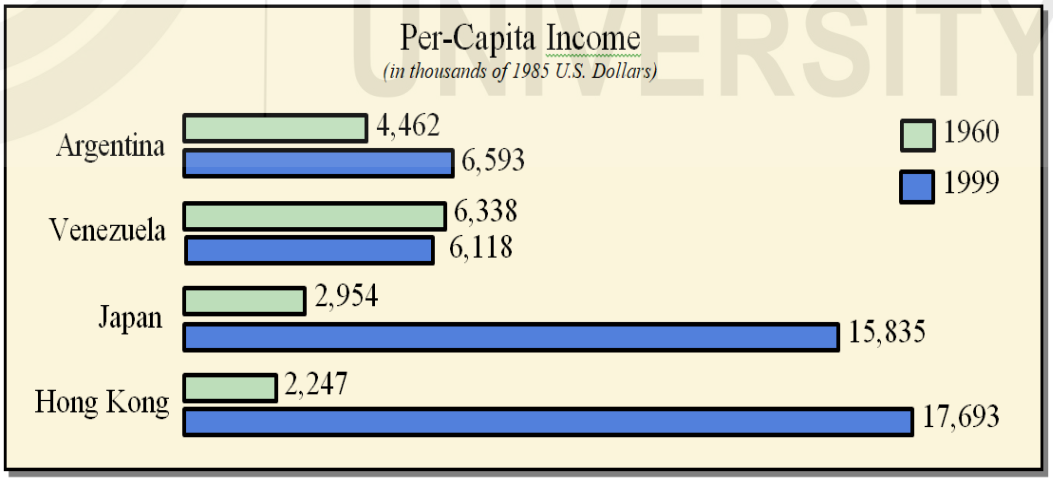
The question arises as to why one should study the growth process. This is because, it helps us to know answers to questions like: (a) why Britain was the first country to industrialize? or (b) why even after having the head start Britain fell behind the United States, Germany and Japan and, more recently, to many other west European countries? or (c) why economic growth has been concentrated in the relatively small part of the world economy of Western Europe, North America and parts of Asia? or (d) what were the reasons for the rapid economic growth of the East and South East Asian economies for almost three decades and (e) how China in the last two decades outshined all previous growth experiences. Economic theory of growth is essential for answering all these questions though it is not sufficient. This is because the growth theory has not developed adequately to explain some important phenomenon like technical progress or the welfare consequences of growth. Besides providing an answer to these questions, there are other important reasons to study economic growth. These are as follows.

The historical experience of each of the economy has some unique characteristics. It involves forces some of which cannot be duplicated in another economy. Economic theory, in these circumstances, can suggest some hypotheses as to why growth occurs at different rates at different times across countries. In the process, it can also identify some strategic variables such as

increases in agricultural productivity, or rate of capital accumulation, etc. Such insights will be useful for other economies to focus upon.

An understanding of the process of economic growth as above would help in *formulation of economic policy*. This needs us to make a distinction between the short term policy measures from the long term policy measures. This is in view of the fact that policies on exchange rate or monetary or fiscal policies have differential impact on the consumption and investment patterns of people in each country differently. One of the reasons why Keynesian policies were so popular across the world was that it identified the rate of investment as a key policy variable which unequivocally applied to all the economies. However, it also proved inadequate because it was not able to offer any potential relationship between productivity and real wages.

Cross country differences in growth rates over a few decades has the potential to substantially alter the per capita incomes in the countries. For instance, from 1960-1999, the per capita income growth in Argentina and Venezuela was 1% and - 0.1% respectively. In the same period, the growth rates of Japan and Hong Kong were at much higher level of 4.4% and 5.4% respectively. Note how the rapid growth rates of the two Asian economies dramatically altered their relative per capita incomes compared to the other two economies (Fig. 1.1).



Source: *Robert Summers and Alan Heston, Penn World Tables*

Fig. 1.1: Cross Country Profile: An Illustration

Some other advantages of studying the growth process may be elaborated as follows.

1) Economic growth creates the potential for offering a wider range of choices (tangible as well as intangible) to the people. For instance, economic growth offers the freedom to enjoy greater leisure or more material wealth in the form of goods and services. In poor countries, around 50–70 percent of the population work in agriculture to feed the entire population. In rich countries, less than 10 percent are enough to do the job. This makes much larger number of people available for other activities (such as medical science, education, scientific research, entertainment, etc.). So, economic growth makes it possible to release people from the basic task of growing food to the more complex and productive economic activities that will serve the larger interests of the society.

2) Rapid economic growth is one of the important instruments to resolve social tensions. Such tensions result from different segments of populations seeking better opportunities like higher wages, improved housing, education, health and other amenities. If the level of income in the economy is stagnant then desires of one group could be met only at the cost of the other groups. Naturally, it leads to social conflicts. Through rapid economic growth this conflict could be avoided to a very large extent.

3) Economic growth increases control of humans over their environment. For instance, higher levels of income resulting from rapid economic growth could be invested in development of life saving drugs, environmentally friendly technologies, etc. That would contribute to protecting life from death and diseases.

4) In the process of economic growth, women are likely to benefit far more than the men. In most low income economies, most of the household tasks are done by women. In the advanced societies, many such tasks are done by machines or hired help. This means women are freed from many such tasks which can be relegated to specialized persons who are better at doing those tasks with the scale advantages. In the process, women gain freedom from drudgery and their potential can be diverted to more productive tasks.

5) Economic growth also permits mankind to indulge in the luxury of greater humanitarianism. This is in the sense that at higher levels of income they can afford to forgo part of their income to uplift others who have not been so fortunate.

6) By far, the process of economic growth has been found to be the most effective to alleviate poverty. The best example of this is the experience of China, India and countries of East and South East Asian economies which are characterized by the common feature of high levels of poverty at one time and rapid economic growth at others. Huge numbers of people have been lifted out of their poverty in these countries. This effect of growth on poverty was at one time termed as the *trickle down effect*. However, since this effect was inadequate, policies to directly help such vulnerable people were adopted in later years. This was possible by the higher amounts of wealth garnered by economic growth in these countries.

Check Your Progress 2

1) Distinguish between 'proportional change' and 'growth rate'.

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2) Differentiate between the 'arithmetic mean growth rate' and the 'geometric mean growth rate'.

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3) In what way the 'geometric mean growth rate' and the 'compound growth rate' are related?

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4) How is studying of economic growth rate is useful at a basic level?

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5) List the other uses of studying the economic growth process.

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1.6 SOURCES OF ECONOMIC GROWTH

There are three major sources of economic growth. These are: (i) investment in physical and human capital, (ii) technological advances and (iii) institutional and policy changes that improve the efficiency of economic organization. Among the other factors which are also important are: (i) competitive markets, (ii) stable prices, (iii) free trade, (iv) flexible capital markets, (v) avoidance of high marginal tax rates, (vi) secured property rights and (vii) political stability. In particular, we can elaborate on the following four major factors which influence or determines the pace of economic growth.

Capital Formation: More capital generally means more production and more production means more growth. Since capital accrues and accumulates by investment, the level of investment is a major determinant of *future* growth. In other words, capital formation is of crucial importance in the *process of economic growth*. It is therefore necessary to step up the rate of capital formation so that a large capital stock of machines, tools and equipment is accumulated over time. Capital formation also requires skilled workforce. Hence, skill formation by education and training is important. Only this enables the physical apparatus or equipment created to be utilised effectively which in turn raises the level of productivity. The larger the stock of capital, the greater would be the productivity of labour. Experience of other countries suggest that a high rate of capital

formation is required to trigger rapid economic growth. For instance, in Japan, investment rate between 1913 and 1939 averaged 16 to 20 percent. In some of the East European countries like Czechoslovakia and Poland, gross investment rates have ranged between 20 and 25 percent. In India, for many years now, the investment rate (which is expressed as a percent of GDP) has been more than 30 percent. In particular, in 2021, India's capital investment as percentage of GDP was 31.2 percent.

Capital-Output Ratio: Another determinant of economic growth is the capital-output ratio. The term 'capital-output ratio' refers to the number of units of capital required to produce one unit of output. Capital-output ratio thus reflects the productivity of capital in the various sectors of the economy at a point of time. The capital-output ratio is not only different for different industries and different economies but also varies over a period of time. There is no unique capital-output ratio that is applicable to all countries at all times. Much depends on the stage of economic development in which a country is at any given point of time. For instance, in the early phase of growth process, when a country is making investment to build up its economic infrastructure [like building irrigation works, hydro-electric projects, roads, railways, etc.], the corresponding additions to output will be small. But with passage of time, as the potential of capacity created is utilised to the full, there will be increased returns in the capital-output ratio. Basic industries like iron and steel, machine tools, engineering and metallurgy are more capital-intensive than consumer goods industries. Consequently, in the initial years of development, when the economic foundations are being laid, the aggregate capital-output ratio tends to be unfavourable. This means, in certain sectors of the economy output can be increased with comparatively small additions to output, while in other sectors, comparatively large additions to capital would be required. But as development gathers momentum, and the emphasis is shifted to the production of consumer goods, relatively smaller increases in investment bring about large increments in output. In other words, the stage of growth and the mix of various types of investment determines the return on capital-output ratio.

Capital-output ratio depends upon the efficiency with which the new types of capital equipments are handled. For this, the quality of managerial and organisational skill is important. Likewise, co-ordination of the investment programme, so as to develop simultaneous complementary economic activities,

has a favourable effect on capital-output ratio. In other words, the capacity of the economy to more effectively use the investment at a particular time influences the capital-output ratio.

The rate of growth of national income in an economy depends upon the rate of investment and the capital-output ratio. This means:

$$\text{Rate of Growth of GDP} = \frac{\text{Investment to Income Ratio}}{\text{Capital - Output Ratio}}$$

In other words, to achieve high rate of growth of national output, economy has to operate on two variables, viz. a) to step up the rate of investment and (b) to generate forces which improve productivity.

Occupational Structure: Another factor which determines economic growth is the occupational structure of the working population. Experience from all over the world suggests that in the process of growth, transfer of workforce from primary to secondary and then secondary to tertiary sector of the economy has invariably taken place. For instance between 1870 and 1930, the proportion of workforce engaged in agriculture in U.S.A. declined from 54 to 23 percent, in France from 43 to 25 percent and in Japan from 80 to 48 percent. Thus, as the momentum of growth picks up, there is an optimum distribution of the workforce in different occupations. As this improves, there will be a more efficient utilisation of workforce which will further boost the overall level of productivity of the economy.

Technological Progress: This is the most widely accepted source of economic growth. Technology makes it possible to produce more from the same quantity of resources (or *factors of production*). This boosts the potential level of output of the economy. The pace of technological change will depend on: (i) the scientific skills of the country, (ii) the quality of education and (iii) the amount of GDP devoted to research and development.

1.7 LIMITATIONS OF ECONOMIC GROWTH

The process of economic growth has certain limitations as well. We should not lose sight of these in the blind race for growth as these could have serious social and economic repercussions for the society (as happened in many of the Latin American countries).

1) **Inequality of Income:** Growth rarely delivers its benefits evenly. Hence, the issue of distribution of the fruits of the growth process becomes the first important limitation of the process of economic growth. There is evidence to suggest that at least in the initial stages of development, growth tends to worsen the distribution of income. There is no doubt that rapid economic growth creates the potential means for alleviating poverty which affects almost all the developing countries. With adequate state intervention, this potential has been used to significantly reduce the incidence of poverty in the economies of East and South East Asian economies, as well as in China and India. It is therefore possible to have economic growth without the majority of population being worse off i.e. to adopt inclusive growth policies by which the fruits of expanded output can be made to reach even the marginalised sections of the population. From this point of view, even though economic growth reaches first the more powerful and the better off sections of the population, thereby initially widening the inequality in the society, it also contributes to significantly uplift those in the lower rungs of society.

2) **Pollution (and other *Negative Externalities*):** The drive for increased output tends to put more and more pressure on the environment. The result will often be increased pollution – air, water and noise. Traffic growth and increased congestion are prime examples of this.

3) **Loss of Non-Renewable Resources:** The more we want to produce, the more resources we need to do that. The faster we use these resources, the less time they will last. This invariably leads to loss of non-renewable resources like oil, minerals, forests, etc. Hence, economic growth makes it possible for people to reach higher level of material welfare for some commodities and at present. However, it reduces social welfare as it also leads to scarcity of some resources for future generations. In other words, it leads to unsustainable growth on a long term time frame. This means, it makes it more difficult for maintaining the present level of welfare in the times to come.

Check Your Progress 3

1) State the three major sources of economic growth.

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2) List the other factors, besides the three major ones, which also goes to determine the pace of economic growth.

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3) How are capital formation and investment linked to economic growth?

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4) State the three limitations of economic growth.

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1.8 LET US SUM UP

The importance of economic growth cannot be overstated. Growth in income is essential for achieving economic, social and even political development. In view of this, in recent years, focusing on economic development has been accorded greater priority. This is true particularly after the 1990s when the concept of HDI was brought under focus making it one of the most dynamic fields in economic analysis. In this unit, the concept of economic growth is explained for its

measurement and process related issues. The unit also elaborated on why we need to study the process of economic growth and how, achieved sustainably, it helps us to make the process of development inclusive to all sections of the society. The unit has finally outlined the limitations of economic growth.

1.9 KEY WORDS

Gross Domestic Product: It is a measure of the level of economic activity in an economy in a particular time period, normally taken as a year or a quarter.

Per Capita Income: This is calculated by dividing the total *gross domestic product* of a country by its total population. Per capita income is often used as an indicator of the *level of living* and *development.* It, however, can be a biased index because it takes no account of *income distribution.*

Economic Growth: A simple definition of economic growth is that it is an increase in the level of output of goods and services that is sustained over a long period of time. It is measured in terms of value added.

Extensive Growth: This refers to the growth in the total output level of an economy.

Intensive Growth: This refers to growth in the per capita output level in an economy.

Trickle-Down Effect: The effect refers to the negative link between the incidence of poverty and the process of economic growth. It means that unless specifically focused upon the needs of the marginalised sections of the society, the fruits of economic growth will touch the marginalised sections as just a 'trickle'. Hence, in order to ensure that people below the levels of poverty are also benefitted by economic growth, focused policies and programmes are needed.

1.10 SOME USEFUL BOOKS

1) Jones, Charles,I. (2013) *Economic Growth second edition (Indian reprint)* Viva-Norton, New Delhi
2) Ray, Debraj (1998) *Development Economics*, Oxford University Press, New Delhi.
3) Solow, Robert M. (2000), Growth Theory: An Exposition (2nd edition). Oxford University Press, Oxford and New York.

1.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1) It is defined as a 'rate of expansion that can move an underdeveloped country from a near subsistence mode of living to substantially higher levels in a comparatively short period of time'.
2) A simple formal definition of economic growth is therefore that it is an increase in the level of output of goods and services that is sustained over a long period of time, measured in terms of value added. It is dynamic because it refers to a continuous expansion in the level of output.
3) An increase in 'output expansion' is defined as extensive growth. Increase of output in per capita terms is defined as intensive growth.
4) This means that the economy moves away from being largely rural and agriculture based to urban and industry based.
5) The term economic development is much more comprehensive than economic growth. It implies progressive changes in the socio-economic structure of a country. It is usually accompanied by a shift in the (i) occupational structure of labour force and (ii) an improvement in its skill and productivity.

Check Your Progress 2

1) Proportional change from x_0 to x_1 is given by: $\frac{x_1 - x_0}{x_0} = \frac{\Delta x}{x_0}$.

   The word 'rate' means multiplication by 100. Growth rate in the above is therefore $100 * \Delta x/x_0$

2) In arithmetic growth rate, the growth in each period is by a constant amount. In the geometric growth rate, the growth in each period is by a constant proportion in each time period. The former is like: a, a + d, a + 2d, a + 3d, & so on where the difference between one term in the series and its immediate previous term is a constant value d. In the latter i.e. the geometric growth rate, the series is like: a, ar, ar^2, ar^3, & so on. Here, upon dividing any two consecutive terms, you get the same value r.
3) The two are the same.

4) It helps us to know the specific characteristics of the economy which has resulted in the growth process being what it is. It provides us a measure by which the economic strength of the country can be expressed in the first instance and compared over different economies, on the other. It then helps us to formulate appropriate economic policies.
5) (i) It offers a wider range of choices to the people. (ii) It reduces social tensions. (iii) It offers a better control over the environment in which the people live. (iv) It leads to better gender equality. (v) It spreads greater equality by its distributional effect. (vi) It can alleviate poverty.

Check Your Progress 3

1) (i) investment in physical and human capital, (ii) technological advances and (iii) institutional and policy changes that improve the efficiency of economic organization.
2) (i) competitive markets, (ii) stable prices, (iii) free trade, (iv) flexible capital markets, (v) avoidance of high marginal tax rates, (vi) secured property rights and (vii) political stability.
3) Capital formation increases the capacity of the economy to produce more. This in turn triggers the need for educated workforce. There is all round productivity enhancement. With increased productivity leading to higher incomes, savings investment ratio is pushed up. Over time, the capital-output ratio starts becoming more and more favourable for higher levels of production. This leads to higher levels of economic growth.
4) It leads to (i) inequality of income (though it also lifts up the people living in poverty), (ii) causes more environmental pollution and (iii) reduces the availability of non-renewable sources of production leading to unsustainable development over the long run.