



BECE-002
Indian Economic
Development: Issues and
Perspectives

Block

2

RESOURCES FOR DEVELOPMENT

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BLOCK 2 RESOURCES FOR DEVELOPMENT

Block Introduction

The present block, the second in the course, is on Resources for Development. The block consists of four units.

Unit 5 is on Monetary and Financial Resources. The unit begins by introducing the definitions of two important concepts viz. savings and investment. The sectoral composition of savings and the distribution pattern of investment is then empirically discussed. The flow of capital to potential investors is ensured by the financial and the capital market systems existing in the country. In light of this, an outline of three related aspects viz. (i) the financial sector in India; (ii) the banking sector in India; and (iii) the capital market structure in India are then discussed in the unit sequentially. The issue of federalism in resource linkages is also touched upon.

Unit 6 is on Physical, Natural and Environmental Resources. The unit first outlines the position on the availability of natural resources in India like land, water, forests and minerals in India. It then discusses the two critical resources for development namely, energy and infrastructure. The recent policy initiatives of the government to improve the situation on these two critical resources is also outlined.

Unit 7 deals with the 'Demographic Features' of India. Beginning with an account of the size and growth of Indian population, important demographic features like urbanisation, population pyramid, dependency ratio, population ageing, demographic dividend, etc. are discussed both conceptually and with empirical support. The features of National Population Policy (2000) is also discussed.

Unit 8 is on National Statistical System. Outlining the statistical system prevailing in India, the availability of 'data as a resource for development' is presented for selected aspects of economy like (i) population and vital statistics, (ii) crop area and production, (iii) industrial production, and (iv) prices. The functions of important statistical agencies in India with an international perspective of statistical data is also presented in this unit.



UNIT 5 MONETARY AND FINANCIAL RESOURCES

Structure

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 - 5.2.2 Concept of Investment
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 - 5.3.1 Rate of Saving
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5.0 OBJECTIVES

After reading this unit you will be able to

- 1 define the concept of saving and investment;

- 1 explain the importance of saving and investment in the growth process;
- 1 identify the trends in saving and investment in India;
- 1 distinguish between the different sources of savings and their relative importance in the Indian economy;
- 1 discuss the evolution of banking sector in India and its present state of development;
- 1 describe the present state of the capital market in India; and
- 1 explain the institutional arrangements in place to ensure the smooth conduct of federalism in India.

5.1 INTRODUCTION

The pace and pattern of development in an economy is determined, to a large measure, by the amount of monetary and financial resources that can be mobilised for use in the development process. These directly determine the rate of capital formation, which, in turn, depending upon the productivity of capital, sets the direction in which the economy grows. In this process, a critical role is played by banking institutions and capital market. The process is also influenced by the existing institutional arrangements for the transfer of resources between different tiers of government in a federal structure. The present unit discusses these aspects which have a crucial bearing on the flow of monetary and financial resources needed for the development of the economy.

5.2 SAVINGS AND INVESTMENT

In a broad sense, the total savings in an economy is expressed as a percentage of its GDP. In a more technical sense, it has certain specific connotation (or forms of expression) about which you will read shortly. Normally, a rate of savings of 30 percent is essential to regard an economy as a high saving economy. India is a high savings economy, when viewed from this yardstick. As a matter of fact, history knows no example of a country, which could achieve some respectable growth with a saving rate of less than 20 percent. The 5-year Tenth Plan average savings for India crossed the 30 percent mark registering an annual average of 31.4 percent. This is remarkable when one considers India's per capita income which is just about 1,042 dollars (giving it a rank of 138 out of a total of about 198 countries in 2007) from an international perspective.

5.2.1 Concept of Saving

Saving constitutes that part of national product that has not been used up in consumption expenditure. The economy's gross domestic product

(Y) is divided among four components viz. consumption (C), investment (I), government purchases (G) and net exports (N_x). Consumption is spending by households on goods and services. Investment is the purchase of capital equipments, inventories, and structures. Government purchases include spending on goods and services by local, state, and the federal governments. Net exports equal the purchases of domestically produced goods by foreigners (exports) minus the domestic purchases of foreign goods (imports). The 'net' in exports refers to the fact that imports are subtracted from exports i.e. $N_x = X - M$, where X stands for exports and M for imports. The subtraction is made because imports of goods and services are included in other components of the GDP.

Total expenditure on the economy's output of goods and services is the sum of C, I, G and N_x . We state it as follows:

$$Y = C + I + G + N_x \quad \dots\dots\dots(1)$$

National savings is the income of the nation that is left after providing for current consumption and government purchases. Thus, national savings, S, equals $Y - C - G$. If we rearrange equation (1) to reflect this fact we get:

$$Y - C - G = I + N_x \quad \dots\dots\dots(2)$$

$$S = I + N_x \quad \dots\dots\dots(3)$$

Now, net exports of an economy always equal net foreign investment. An open economy interacts with the rest of the world in two ways – in world market for goods and services and in world financial markets for credits and investments. Net exports and net foreign investment each measure a type of imbalance in these markets. While net exports measure the imbalance between a country's exports and its imports, net foreign investment measures the imbalance between the amount of foreign assets bought by domestic residents and the amount of domestic assets bought by foreign buyers. An important but subtle fact of accounting states that, for an economy as a whole, these two imbalances must offset each other so that net foreign investment (NFI) always equals net exports (N_x) so that:

$$NFI = N_x \quad \dots\dots\dots(4)$$

Equation (4) holds because every transaction that affects one side of this equation must also affect the other side by exactly the same amount (i.e. ideally, if an imbalance is to be avoided). Since N_x always equals NFI, we can re-write equation (3) as:

$$S = I + NFI \quad \dots\dots\dots(5)$$

i.e. Savings = Domestic Investment + Net FI.

Savings in an economy is usually measured and expressed as a proportion of GDP. This ratio is called as the rate of saving. The rate of saving may

be (i) gross rate of saving, or (ii) net rate of saving. The two are expressed and measured as follows:

i) GROSS SAVING RATE (GSR) is measured as:

$$= \frac{\text{Gross Saving}}{\text{Gross Domestic Product}}$$

ii) NET SAVING RATE (NSR) is measured as:

$$= \frac{\text{Net Saving}}{\text{Gross Domestic Product}}$$

Consumption of fixed capital is the amount of depreciation that the capital stock undergoes during the process of production. Both, GSR and NSR, reflect average savings rates. In the development process, it is important to find out what happens to incremental income i.e. how much proportion of additional income is consumed (or correspondingly saved). The amount of additional income consumed in an economy depends on its marginal propensity to consume (MPC), which is defined as $\Delta C/\Delta Y$. Correspondingly, marginal propensity to save (MPS) is defined as $\Delta S/\Delta Y$. MPC and MPS add up to unity i.e. $MPC + MPS = 1$. Therefore, it is the value of MPC that determines what proportion of additional income generated in an economy becomes available for capital formation.

It is important to note here that when the total spending on goods and services rises from one year to the next, one of the two things must be true: (i) either the economy is producing a larger amount (output) of goods and services, or (ii) goods and services are being sold at higher prices. Therefore, when studying changes in the economy over time, economists want to separate out these two effects. In other words, they want a measure of the total quantity of goods and services the economy is producing that is not affected by (or free from the effect of) changes in prices. To achieve this, economists use a measure called 'real GDP'. The real GDP answers a hypothetical question: what would be the value of the goods and services produced this year if we valued them at the prices that prevailed in some specific year in the past? By evaluating current production using prices that are fixed at past levels, real GDP shows how the economy's overall production of goods and services have changed over time.

The Planning Commission in its plan exercises emphasise the use of gross saving rate. The use of gross saving rate and gross investment rate have both a positive and a negative aspect. On the positive side, it is quite correct to say that it is the total investment (including replacement of existing assets) which is of material significance. This is as opposed to the concept of net investment, wherein, capital consumption is estimated under diverse assumptions of the life of assets and their

replacement cost. On the negative side, since in modern industry, the pace of obsolescence is increasing at a much faster rate than the actual wear and tear of capital assets in the process of production, it would not be wise to ignore the problem of obsolescence (quite apart from the problem of the finite physical life of assets). The other practical problem that arises with the planning commission's treatment of resources is that, with depreciation provision included in the totality of plan resources, there has been a tendency to use up as much of available financial resources as possible for funding new projects. This tendency too, in effect, neglects the effect of maintenance and replacement of existing capital assets.

5.2.3 Concept of Investment

The concept of investment actually means 'expenditure incurred on acquisition of capital goods' that results in capital formation. We can distinguish between gross domestic capital formation (GDCF) and net domestic capital formation (NDCF). GDCF is defined as the sum of gross domestic fixed capital formation (GDFCF), changes in stocks in a year (CS), and the net acquisition of valuables (i.e. value of acquisition less value of disposals) by enterprises and households (NAV). Symbolically:

$$\text{GDCF} = \text{GDFCF} + \text{CS} + \text{NAV}$$

NDCF is equal to the difference of the sum of GDCF and current replacement cost (CRC), also known by different names as consumption of fixed capital, depreciation or capital consumption. Again, symbolically:

$$\text{NDCF} = \text{GDCF} - \text{CRC}$$

All these estimates can be derived at current prices or with reference to some base year prices; the former estimates represent the nominal value or money value, whereas the latter estimates represents the real value.

Capital formation, thus, signifies addition to the reproducible wealth of a country. It measures that part of national wealth that is retained for use in further production.

Like saving, capital formation too may be either (i) net capital formation, or (ii) gross capital formation. Net capital formation is distinguished from gross capital formation by that, the former is arrived at after deducting from the latter the part relating to depreciation. Depreciation itself, as said before, refers to obsolescence and damage to fixed capital due to wear and tear. Thus, net capital formation is the addition to fixed capital and producers' stock of working capital. Addition to fixed capital specifically takes the following three forms: (i) existing buildings (residential and non-residential), (ii) construction and other works currently in progress, and (iii) machinery and equipment.

5.3 TRENDS OF SAVING IN INDIA

Historically, India's average saving rate has been higher than that of many of the Latin American economies. But the latter have posted a better economic growth record than India. On the other hand, the East and Southeast Asian Economies have been successful in achieving both high saving rates as well as high growth. All the same, a higher domestic saving rate makes larger investment possible in an economy and hence is a *necessary* condition for economic development (although *not a sufficient* condition). Furthermore, it is important to note that in an open economy framework, domestic savings are supplemented by foreign savings. Since foreign savings may imply liability to the domestic economy, it is necessary that domestic savings rates should be increased and resort to foreign savings should be to the minimum. As said before, experience indicates that a saving rate of up to 20 percent is essential for any economy to achieve respectable growth rate. This makes us interested in knowing the trends in saving in India, and analyse as to how far domestic saving has been sufficient to finance the development needs of the economy.

5.3.1 Rate of Saving

Rate of saving is measured as a proportion of GDP at market prices. The rate of saving in India in 1950-51 was 10.2% of the GDP. Over the next twenty years, its trend varied marginally, to touch a rate of 16.3 percent in the year 1972-73. During the decade of 1970s, there was a significant improvement in the saving rate which rose to 26.0% in 1979-80. In light of this, the late 1970s was referred to as the golden era in the Indian savings scene. Comparing these rates with the ratios for other group of countries, the planning commission remarked: 'it is apparent that the country has achieved a high saving rate, despite its low per capita income. In fact, our saving rate is comparable to the rate in middle income and even some high income industrialised countries'. These rates of saving were not, however, sustained as it dropped substantially during the 1980s: it fell to 18.2 percent in 1984-85. In the subsequent years, although it recovered somewhat to reach 22.0 percent in 1992-93 and reached its late 1980s level of 26.9 percent in 1995-96, it declined again to below 25% mark in late 1990s. The decline during the late 1990s is attributed to a sharp decline in public saving as we shall see in section 5.3.2.

The saving rate began to increase steadily in the 2000s with the Tenth Plan average (for 2002-07) registering 31.4 percent (Table 5.1). The growth in saving is attributed to factors like: (i) rising per capita income; (ii) continued deepening of the financial system; and (iii) the diminishing share of agriculture in GDP (as this would mean a rise in the share of the manufacturing and services sector's share which are relatively known to offer greater scope for income and saving).

Table 5.1 : Rate of Gross Domestic Saving

(Percent of GDP at current market prices)

Year	Rate of Saving
2001-02	23.5
2002-03	26.4
2003-04	29.8
2004-05	31.8
2005-06	34.3
2006-07	34.8
Tenth Plan Average	31.4
2007-08*	35.0

* Estimated

5.3.2 Sectoral Composition of Saving

Domestic saving accrue from three sectors viz. (i) government or public sector, (ii) private corporate sector, and (iii) the household sector. The public sector includes government administration, departmental undertakings, government companies and statutory corporations. The private corporate sector comprise non-governmental non-financial corporate enterprises. The rest is termed household sector. Thus, the household sector, being residual in character, includes a host of economic agents who engage in production/consumption activity as shown in Table 5.2 below. Among the three sectors, as in most other countries, the

Table 5.2: Sectoral Composition of Savings

(at current prices - percentages)

Year	Household	Public	Corporate
1950-51	73.7	17.2	9.1
1960-61	66.0	20.6	13.4
1970-71	71.8	18.5	9.7
1980-81	75.9	16.2	7.9
1990-91	84.0	4.5	11.5
2000-01	89.3	-7.4	18.1
2001-02	93.7	-10.4	16.7
2002-03	89.1	-3.66	14.56
2003-04	82.75	3.1	15.51

Year	Household	Public	Corporate
2004-05	75.7	8.63	15.66
2005-06	68.83	5.39	25.78
2006-07	67.65	5.88	26.47
X Plan Average	75.47	5.42	19.11
2007-08	65.71	8.58	25.71
2011-12 *	61.54	10.26	28.20

* Projected

household sector in India too contributes the bulk - more than two-third of the total savings. The government sector and the corporate sector contribute the balance i.e. about one-third of total saving in the country.

A closer analysis of the temporal trend, presented below, reveals that the sectoral shares show varying degrees of growth and change over the years.

I Household Savings: The household sector is the largest contributor to domestic saving. It is important as it reflects how efficiently savings are converted into investment with the role of financial sector's intermediation in the process. Household savings can be divided into three parts as follows.

- (a) **Physical Assets:** The physical assets include housing, machinery, furniture, fixture and real estate.
- (b) **Financial Assets:** This takes the form of currency, bank deposits, shares and debentures, claims on government, mutual funds, national savings certificates, life insurance funds and provident and pension funds.
- (c) **The Unaccounted Savings of the Household Sector:** The unaccounted savings of the household sector are always kept in the form of gold, silver and durable goods on which information is very scanty. However, on the basis of estimates (relating to the ratio of black money to GNP) the proportion of these assets is placed in a range of 3 to 10 percent of the GNP in any year.

Relative Share of Financial and Physical Assets in the Economy

(a) Pre-Reform Years

Estimates of the distribution between the physical and financial assets for the decades of 1950s, 1960s and 1970s reveal that, by and large, financial assets averaged around 45 percent during this period. The reasons for this relatively low share of financial assets are attributed to habit, illiteracy and absence of alternatives in the form of a well developed banking and financial sector. Towards the end of the 1970s,

the share of financial assets moved up to around 50 percent and since then, with a few jumps and falls, it has been steady at around 50 percent of the total household sector savings in the economy. Improvement in the share of financial assets during this period are attributed to:

- i) increase in household income that has taken place due to economic development and the accompanying distribution and consumption factors; and
- ii) expanded infrastructure of banking and other facilities providing increased access to greater segments of the population.

Post-Reform Years

The change in the financial assets portfolio of the household sector investments, during the post-reform years of 1991-2007 is presented in Table 5.3.

Table 5.3 : Savings of Households in Financial Assets (%)

Instruments	1990-91	1999-00	2003-04	2006-07
I Currency	10.6	8.9	10.1	8.6
II Bank deposits	31.9	33.7	42.8	46.2
III Non-banking deposits	2.2	3.6	0.2	0.9
IV Life insurance	9.5	11.4	14.9	15.0
V Provident and pension fund	18.9	23.7	13.0	9.2
VI Claims on government (Incl. small savings)	13.4	12.7	17.7	5.2
VII Shares and debentures	8.4	6.3	9.8	6.3

The analysis of data in Table 5.3 brings out the following.

1. The three fairly steady avenues of household savings are: bank deposits, life insurance and currency.
2. Despite the growth of the capital market in mobilising funds, the household savings channelled to the stock markets as a proportion to total savings is relatively low.
3. Households continuously moved their savings back and forth between instruments of different kinds in response to changes in returns, market trends, etc.

II Government Savings: Government savings come from surpluses of public enterprises and other public financial institutions. Government savings formed 17.2 percent of total savings in the economy in the year 1950-51, which increased to 20.6 percent in 1960-61. Since then,

there has been a steady decline in government savings which touched a low of minus 2 percent in 2001-02. Among the factors responsible for this trend, the most important are identified as follows:

- i) Deterioration in the overall tax GDP ratio, and
- ii) The increasing losses over time made by public sector utilities such as state Electricity and Water Boards, State Road transport Corporation, and the Railways.

Since 2003-04, government savings have shown a turn around accounting for about 2% of the GDP in 2005-06 and 2006-07. This further went up to 3.0% in 2007-08. This change is attributed to: (a) economic upturn; and (b) the efforts to improve fiscal management at the centre and in the states. With the central government keen to abide by the targets set by the Fiscal Responsibility and Budget Management Act and most of the state governments enacting similar legislation, one can expect a further improvement in the savings of government administration. These are projected to go up to 4% of the GDP in 2011-12. Even at this, it would account for only 10.26 percent of the total savings which is less than the level in which we were in the decades of 1950s and 1960s.

III Private Corporate Savings: The share of private corporate sector in total savings was 13.4 percent in 1960-61. This, however, came down to 7.9 percent in 1990-91. But it has been moving upwards since then, reaching an average of 17.4 percent during the Ninth Plan period and 19.1 percent during the Tenth Plan period. However, even with this improved performance, when compared with that of the other countries, it has been disappointing. Whereas in developed countries the corporate sector contributes significantly to national savings, it has not done so in India, in spite of the development within the secondary and tertiary sectors of the economy and the significant increase in manufactured output. This is attributed to the following factors:

- i) massive increase in the use of loan capital in Indian industry and the fall in the share of profits in factor incomes;
- ii) significant position of the unincorporated private sector in Indian manufacturing and commerce which is reflected in household savings and not in the 'private corporate savings'; and
- iii) the taxation policy which discourages the accumulation of undistributed profits in companies and corporations coupled with a low profitability syndrome.

Check Your Progress 1

1. How is saving defined and measured in an economy?

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2. What do you understand by investment? Distinguish between gross capital formation and net capital formation.

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3. What are the major sources of savings in India? Which sector makes the largest contribution to savings in India?

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4. Mention the factors that are responsible for the growing share of financial assets in the household savings in India.

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5.4 TRENDS IN INVESTMENT IN INDIA

The gross domestic capital formation (GDCF) in the economy has shown an upward trend ever since the beginning of economic planning in 1950-51. However, there have been breaks in between. In the pre-reforms period the rate of investment as a proportion of GDP went up from 10.0 percent in 1950-51 to 24.8 percent in 1978-79. The increase in the succeeding years was less steep with the rate of investment touching only 26.3 percent in 1990-91. Subsequently in the post-reforms period, the rate of investment experienced a decline, during the decade of 1990s. A major increase occurred in 2004-05 when it crossed the 30 percent mark (Table 5.4). Comparing the trends in gross domestic savings presented in Table 5.1 with that of gross domestic capital formation in India presented in Table 5.4, it would be seen that the investment rate has moved in consonance with the growth in domestic saving rate. Such a trend in investment linked to domestic savings augurs well for sustained economic growth.

Table 5.4: Rate of Investment

(percent of GDP at current market prices)

Year	Rate of Investment
2001-02	24.2
2002-03	25.2
2003-04	26.8
2004-05	31.6
2005-06	34.5
2006-07	36.0
X Plan Average	30.8
2007-08	36.3

5.4.1 Distribution Pattern of Investment

The distribution pattern of investment can be studied in three ways as follows:

- 1. Distribution of Capital Formation by Type of Asset:** Capital formation by asset in an economy can take three forms viz. (a) construction, (b) machinery and equipment, and (c) changes in stocks (i.e. inventories). Presently, construction accounts for about 40 percent of GDCF, machinery for 50 percent and inventories for about 10 percent.
- 2. Distribution of Capital Formation by Industry of Use:** Investment has been done in all the three sectors of the economy (viz. primary, secondary and tertiary) with varying degrees of concentration. Presently, the tertiary sector accounts for the largest share of capital formation (more than 42 percent) followed by the secondary sector with a share of about 35 percent. The agricultural sector has thus relatively lagged behind the other two sectors in attracting investment.

The trends in investment over the period 1950-51 to 2006-07 tell us that the sub-sectors which have received higher investment are manufacturing, mining, construction and electricity. On the other side of this investment profile, sectors which have experienced a declining trend in investment include real estate, agriculture, transport and public administration. In the remaining sectors (viz. trade, hotels & restaurants, law & order and judiciary) the changes over the period are marginal, [see key words for a sectoral classification of industries]

- 3. Distribution of Capital Formulation by Management:** We can also study the distribution of capital formation by sectors of management viz. the public and the private sectors. The gross capital

Table 5.5 : Gross Capital Formation In India

(Rs. Crore)

Year	Public	Private	Total
1950-51	294 (28.3)	743 (71.7)	1037 (100.0)
1960-61	1259 (50.1)	1253 (49.9)	2512 (100.0)
1970-71	3104 (43.0)	4107 (57.0)	7211 (100.0)
1980-81	12994 (48.2)	13990 (51.9)	26964 (100.0)
1990-91	49707 (43.0)	65982 (57.0)	115689 (100.0)
2000-01	144038 (29.2)	348647 (70.8)	492685 (100.0)
2006-07	321753 (22.3)	1120851 (77.7)	1442604 (100.0)

Note: Figures in parentheses are percentage to row totals.

formation in the public sector has increased from Rs. 294 crore in 1950-51 to Rs.3,21,753 crore in 2006-07 (Table 5.5) maintaining an upward trend throughout the five decades period. The gross capital formation in the Private Sector too has been rising. During the period 1950-51 to 2006-07, it went up from Rs. 743 crore to Rs. 11,20,851 crore. Leaving out the year 1950-51, during the period 1961-81, the gap in the relative shares of GCF between the public and the private sector was marginal. This difference began accentuating from 1990-91 and widened steeply to reach the 1950-51 level by the year 2000-01. This difference further increased by the year 2006-07. Evidently, public sector investment was a low-key affair in the post-reform phase. The trends are also suggestive of the fact that the policy of economic liberalisation succeeded in inducing larger investment in the private sector.

5.5 NET CAPITAL INFLOW

Net capital inflow is the difference between 'net domestic capital formation' and the 'net domestic saving'. It can be measured as a proportion of national income, or alternatively expressed as the difference between the domestic saving and investment rates. If the domestic investment rate exceeds the domestic saving rate, the rate of net capital inflow will be positive. Conversely, the net capital inflow will be negative if the investment rate falls short of the saving rate.

As reviewed above, there has been a significant increase both in the saving rate and the investment rate in India since 1950-51. The investment rate, by and large, has exceeded the saving rate to yield a small positive net capital inflow. As percentage of NDP, the net inflow of foreign capital to India has been very modest at around 1 to 2 percent (Table 5.6). You will study more about foreign investment in unit 18 later.

In future, as the investment rate is pushed up to achieve the postulated higher rates of growth, increasing resort to foreign resources may become inevitable. This implies that the flow of foreign investment has to increase. Any attempt to slow down this trend will affect the growth and lead the economy to stagnation. A positive change in this scenario in more recent years has been that the FDI is becoming a major component of foreign capital inflow. Such capital not only bears the risk of investment decisions, but is also not easily reversible. Earlier, the balance of payments deficit was primarily financed by debt inflows. The rise of investment inflows implies that the economy can now absorb a larger balance of payment deficit.

Table 5.6: Net Inflow of Foreign Capital (as % of NDP)

Year	Net Inflow	Year	Net Inflow
1950-51	-0.2	2001-02	0.9
1960-61	3.1	2002-03	0.8
1970-71	1.0	2003-04	2.2
1980-81	1.7	2004-05	0.1
1990-91	3.4	2005-06	1.4
2000-01	1.4	2006-07	2.0

Check Your Progress 2

1. What has been the long-term behaviour of investment in India?
What change has occurred in it during the last few years?
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.....
2. In which sector of the economy, public or private, larger share of investment has taken place?
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3. Define 'net capital inflow'? What has been its trend in India in the recent years as percentage of NDP?

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5.6 FINANCIAL SYSTEM IN INDIA

The financial system influences the pace of economic development as it performs the role of intermediation between the saver and investor. Financial intermediation facilitates the mobilisation of financial resources on the one hand and its allocation to potential investments on the other. Financial institutions thus act as an important vehicle for mobilising and transferring the economy's surplus to the ultimate users.

Among the financial institutions, the most important, both in terms of their numbers and spread, are the commercial banks. The commercial banking system is spread through the length and breadth of the country. It has three components viz. public sector banks (consisting of the State Bank of India and its seven associate banks, 20 other banks principally owned by the government), private sector banks and the foreign banks. Besides, there are also co-operative banks and regional rural banks performing commercial banking functions. The relative significance of private sector banks and foreign banks is increasing in the emerging new economic environment. We will learn more about the banking sector, in the section 5.7 of the unit.

In a liberalised economic environment, the most significant role of financial intermediation is played by the capital market. The capital market in India has also been spreading both in its depth and spread. This has been facilitated by the emergence of new institutions and instruments, both capital market instruments and money market instruments. It is a paradox of an open economy that the more liberalised a system, greater is the need for watchdog bodies. The Security Exchange Board of India (SEBI) has emerged as an important regulatory body overseeing the functioning of the capital market, and directing its growth along the desired course. You will learn more about capital markets in section 5.8 of the unit.

The state also participates in the financial system both as a borrower and lender. It has the responsibility to define the policy parameters, and help in building up a conducive banking environment to support its growth and welfare objectives. Adequate institutional arrangements need to be

put in place to ensure the smooth flow of resources to the governments (at different tiers, i.e. union, state and local government levels) and the non-governmental agents in the economy i.e. private sector economic agents of which the credit needs of the entrepreneurial class including petty retail traders need to be ensured. For this, a sound banking sector is vital. It is, therefore, time to take a look at the banking sector development in India.

5.7 BANKING SECTOR IN INIDA

Modern banking business was initiated by British Agency Houses set up in Kolkata and Mumbai. The first bank called the Bank of Hindustan was established in 1770. By the time the country achieved independence in 1947, India had a fairly well-developed and closely knit banking system.

5.7.1 Evolution of Banking Since Independence

Since independence, banking in India has evolved through four distinct phases.

1. **Foundation Phase:** It lasted through the decade of 1950s and 1960s. This phase witnessed the development of necessary legislative framework for facilitating the functioning of the banking system for meeting the requirement of the Indian economy.
2. **Expansion Phase:** This began in mid 1960s and gained momentum after the nationalisation in the late 1960s.
3. **Consolidation Phase:** This phase began around 1985. During this phase, attention was paid to improving housekeeping, customer service, credit management, staff productivity and profitability of the banks.
4. **Reform Phase:** Beginning 1991, this phase saw important initiatives like introduction of new accounting practices, development of norms relating to income recognition and capital adequacy. This phase also saw an increasing trend towards the consolidation process driven by competition.

Presently, the commercial banking system consists of 181 banks and 71,781 branch offices.

5.7.2 Constituents of the Commercial Banking System

As said in the previous section, the three constituents of the commercial banking structure in India are: (i) public sector banks, (ii) private sector banks, and (iii) foreign banks.

Public Sector Banks: The nationalisation of the banks took place in two phases. In the first phase, 14 major commercial banks were nationalised in 1969. In the second phase, 6 more banks were nationalised

in 1980. With the nationalisation, banks in India came to acquire two faces viz. (i) a commercial side i.e. to generate income for building the financial strength necessary to satisfy the regulatory standard and also provide for the wherewithal of future growth; and (ii) a non-commercial side i.e. to finance the setting up of economic enterprises in backward areas so as to aid the process of balanced regional development and social uplift.

Public sector banks account for a little over 70 percent of total deposits and total advances of all banks in India.

Banks in the Private Sector: The area of operation of private sector banks had considerably narrowed down after the two-phase nationalisation. Private sector banking received a boost with the announcement of the New Economic Policy in 1991. The RBI issued a set of guidelines on January 22, 1993 for private sector companies wishing to enter the banking sector. Following this, initially eight new private banks were set up. There has been a gradual expansion of the private sector banks accounting for a market share of 20 percent of total deposits and advances of the banking sector. At present, there are 28 banks with 7,099 branches. A recent study has brought out that the private banks are performing better than the nationalised banks in terms of loans advanced, growth, average yield on earning assets, innovative provisions and low operating expenses to emerge as the frontrunners in the industry.

Foreign Banks: The foreign banks in the private sector are branches of those banks which are incorporated in foreign countries. There are at present 29 such banks with 272 branches. Most foreign banks perform essentially the same range of services as commercial banks, except that their focus in terms of product and customers are different in that they mainly cater to the upper-end segments of the society. Besides, these banks have been introducers of modern financial engineering products - such as swaps, electronic fund transfers, etc.

5.7.3 Banking Reforms in India

The Government had appointed two committees (both under the chairmanship of M. Narasimham) the first to examine the aspects relating to the organisation, structure, functions and procedures of the banking system, and the second to examine the issue of banking reforms. Acting on the recommendations made by these two committees, the government initiated a series of reforms in the banking sector.

Goals of Reforms

Goals of banking sector reforms are defined as follows:

- i) To correct and improve the macro-economic policy setting within which the banks operate. This involves monetary control reforms

including rationalisation of interest rates, redesigning direct credit programmes, and bringing down the levels of resource pre-emption;

- ii) To improve the financial health and condition of banks by recapitalising and restructuring the incentive system under which banks operate;
- iii) To establish the related institutional infrastructure to assist in and of monitoring, audit, technology up-gradation and legal support;
- iv) To improve the level of managerial competence and the quality of human resources by reviewing the policies relating to recruitment, training, placement, etc.;
- v) To improve access to financial savings;
- vi) To reduce intermediation costs and distortions in the banking system;
- vii) To promote competition by the establishment of a level playing field allowing for free entry and exit of operators in the sectors under a regulatory framework; and
- viii) To develop transparent and efficient capital and money markets.

The major reforms introduced so far may be broadly classified as follows:

- i) There are overall monetary policy issues relating to interest rates and exchange rates, reduction in SLR and CRR, modification in refinance facilities, development of alternative system of monetary controls, development of securities and capital markets, etc.
- ii) There are measures for strengthening banks by way of transparency in the financial statements of banks, clearing up of balance sheets by way of prescription of prudential norms for income recognition, asset classification and provisioning for impaired assets, and improving the risk absorption capacity by adopting prudential norms for capital adequacy. Computerisation of banking transactions, reorganisation of individual institutions to enhance competitive capabilities and to facilitate provision of better services to managements in managing the affairs of individual banks, machinery for customer grievances redressal, etc. fall into this category.
- iii) There are steps to enhance competition in the financial sector by allowing entry of private – Indian and foreign – banks with state of the art technology, giving more freedom to expand the operations of existing private banks, and widening the scope of activities of banking and non-banking institutions.
- iv) There are issues relating to strengthening the regulation and supervision over banks and more particularly over the very large number of non-banking financial institutions.

- v) Further, a number of steps have been taken to ensure balanced development of various segments of the financial market as also to preserve the integrity and transparency of the banking system.

Outcome

The outcome of the implementation of various reform has been impressive with the banks responding to the deregulation measures by restructuring their operations and upgrading their performance standards. Introduction of a new balance sheet format, attainment of capital adequacy and institution of many prudential norms have helped to bring out the true strengths and weaknesses of each bank. The reforms have thus created strong compulsions for improvement in the working of banks. This resulted in some banks, which were making losses in successive years, achieve a turnaround.

Focus Areas for Future

Focus areas for future include:

1. Cost management which is a key to sustainability of banks’ profits as well as their long-term viability.
2. Recovery management which is the key to the stability of the banking sector.
3. Technological intensity of banking which is an area in which India needs to significantly catch up.
4. Risk management practices which is important to stay ahead in a competitive environment. Banks need to formulate ‘early warning indicators’ suited to their own requirements, business profile and risk appetite.
5. Improved corporate governance which would provide an opportunity to accord greater freedom to the banks’ boards and help move away from micro regulation to macro management.

Check Your Progress 3

1. Trace the evolution of banking sector in India since independence.
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2. State in brief the major constituents of the commercial banking system in India.
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3. Mention in brief the goals of banking reforms in India.

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5.8 CAPITAL MARKET IN INDIA

In the liberalised economic environment, the capital market is all set to play a highly critical role in the process of development. The capital market has to arrange funds to meet the financial needs of both the public and private sector units. The capital market has also to arrange for the other resource needs of both the domestic and foreign units. What is more critical is that the changed environment is characterised by cut throat competition. Ability of enterprises to mobilise funds at cheap cost will determine their competitiveness vis-à-vis their rivals. Capital market, thus, consist of all those institutions and arrangements that are required to ensure the smooth functioning of different players (e.g. banks, stock exchanges, regulators, etc.) charged with the responsibility of arranging financial resources for production units in the economy. The capital market in India has witnessed metamorphic changes in recent past.

5.8.1 Changes in the Capital Market

Three sets of changes in the Indian capital market can be identified which set the market of the 21st century different from what obtained earlier.

a) Establishment of New Institutions

The composition of the capital market has undergone a complete change. Till recently, the capital market in India was dominated by Bombay Stock Exchange. The daily turnover on the Bombay Stock Exchange (BSE) alone exceeded the total turnover of all other exchanges put together. The BSE, with its monopolistic share of the market, was an impediment to the spread and diversification of capital market structure. In response to this situation, the National Stock Exchange (NSE) was set up. The NSE has since emerged as the largest exchange of the country. The NSE has also served as a catalyst of change for other exchanges in introducing on-line trading systems.

Along with NSE, we have also witnessed the emergence of mutual funds.

Different types of mutual funds catering to the needs of different types of investors have been set up in the country.

The increasing growth of the capital market has also witnessed the emergence of foreign institutional investors (FIIs) as significant players. Their sale and purchase decisions make a significant impact on the market conditions.

Along with these new players, a set of new supporting institutions have emerged. Among these, specific mention may be made of: (i) Discount and Finance House of India, (ii) Securities Trading Corporation of India, (iii) Stock Holding Corporation of India, and (iv) Settlement and Depository Systems.

b) Introduction of New Instruments

Along with new institutions there have emerged new instruments on the capital market. These encompass both the domestic instruments as also foreign instruments. Despite this, it is argued that there is tremendous scope to deploy new financial instruments connected to equity, debentures, bonds, add-on products and derivatives. This requires appropriate changes in certain economic legislations. The initiative on the part of the Indian corporate enterprises to take risks by fine tuning their decision-making mechanisms to suit the investor psychology and market preferences is an important factor which influence the development of these new financial instruments.

c) Changes in the Administrative Framework

Responding to the changes in the environment, the administrative framework has also undergone a overhaul. The earlier chains have been removed and the capital markets made free to find their own depth and strength. However, it is important to note that in a free market economy whenever chains are removed effective watchdogs or regulatory bodies have to be employed. Such bodies are required not only to ensure proper functioning of the capital market agents but also to ensure other goals of development such as equity, competition and fair play. In India, these functions has been entrusted to the Securities and Exchange Board of India (SEBI). The SEBI, in turn, has been laying down guidelines to be followed by different players in the different segments of the market.

5.8.2 Globalisation and the Indian Capital Market

With the gradual opening up of the Indian economy there has been an increasing presence of foreign portfolio investment in the Indian markets. The Indian capital market is thus acquiring a global image. Indian capital market has responded to all these developments favourably. However, globalisation of the capital market will also mean the following:

- i) The market will be more sensitive to developments that take place abroad.

- ii) There will be a power shift as domestic institutions are forced to compete with the FIIs who control the floating stock.
- iii) Structural issues will come to the fore with a plain message i.e. reform or despair.
- iv) Significance of mutual funds will increase for the individual investor as they would be managed by professional managers insulating from the risk of the volatile stock market operations.

5.8.3 Deficiencies in the Capital Market

In view of the changing global environment, it is necessary that the deficiencies in the Indian capital market are identified and proper solutions found to tackle these deficiencies. Important deficiencies in the Indian capital market are identified as follows:

- i) lack of diversity in the financial instruments;
- ii) lack of control over the disclosure of financial information;
- iii) under development of secondary market;
- iv) prevalence of insider trading and front running leading to manipulation of security prices;
- v) existence of unofficial trade in the primary market, prior to the issue coming into the market;
- vi) absence of proper control over brokers and sub-brokers;
- vii) 'wholesale' nature of the market which makes it more suitable for institutional investors and high worth individuals than for the numerically large small investor class;
- viii) passive role of public financial institutions in checking the malpractices; and
- ix) high cost of transactions and intermediation, which is mainly due to the absence of well-defined norms for institutional investment.

All these issues fall within the domain of the SEBI. The SEBI is engaged in the task of finding meaningful solutions to these.

Check Your Progress 4

1. What are the changes in the capital market that have taken place in recent years?

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2. What is the impact of globalisation on the Indian capital market?

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3. Mention in brief the deficiencies in the Indian capital market.

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5.9 FEDERALISM IN RESOURCE LINKAGES

Besides being a facilitator, the state has a more direct stake in the financial system, as it needs financial resources to meet its own expenditure liabilities. In a federal set up, governments are set up at different tiers to discharge different functions and responsibilities. Each of these governments, thus, has its own stake in an efficiently functioning financial system.

5.9.1 Federal Finance in India

India with a federal form of government, has a federal finance system. The essence of the federal form of government is that the Central and the State Governments should be independent of each other in their respective, constitutionally demarcated, spheres of action. The constitution should spell out distinctly and separately the functions to be performed by respective governments. Once the functions of the Governments have been spelt out, it becomes equally important that each of the Governments should be provided with competent sources for raising adequate revenue to discharge the functions entrusted to it. Thus, for the successful operation of the federal form of government, two important conditions are essential viz.

- i) Each government should have independent sources of revenue; and
- ii) Each government should have total command over its resources to meet its needs.

In short, financial independence and adequacy constitute the backbone of the federal finance system.

5.9.2 Evolution and Provisions

The evolution of the federal finance system in India can be traced to the Government of India Act, 1935. This Act was based on the general principles of financial independence for the provinces. The constitution of independent India accepted this basic principle of federal finance to achieve the following:

1. **Financially strong Centre:** This is sought to be achieved through the following measures:
 - i) Powers of concurrent taxation have been avoided.
 - ii) The centre has been assigned the more elastic and higher-yielding sources of revenue.
 - iii) The centre has been given the subjects of money and banking, currency and coinage, and the power to resort to deficit financing.
 - iv) The centre has been provided with certain exclusive sources of revenue.
 - v) The residuary powers are with the centre.
2. **Efficient allocation of functions and financial powers:** The constitution has divided the various functions into three lists viz. (i) The Union list, (ii) The states list, and (iii) The Concurrent list. Financial powers have, likewise, been divided between the centre and the states.
3. **Provision for resource transfer:** To this end, the constitution provides three means viz. (a) tax-sharing, (b) grants, and (c) loans.
4. **Flexibility in resource transfers:** Resource transfers from the centre to the states are recommended every five years by the Finance Commission.

A detailed discussion of the issues of federal finance is provided in unit-10 of the course.

5.10 LET US SUM UP

Monetary and financial resources play a critical role in the process of economic development serving to lubricate the growth engine. The origin of finance lies in the amount of savings that are generated in the economy and the financial system by which they are mobilised and lent for purposes of capital formation. India has attained high rates of saving and investment enabling the realisation of high economic growth rates achieved in recent years. The process of capital formation is facilitated by the presence of a healthy banking and capital market structure. Both the banking and capital market structure have undergone dramatic changes over the last two decades or so. These are responding, very actively, to global developments, and, in the process, are getting modified to suit the

requirements of the increasingly globalising Indian economy. It is important at this stage of development to carefully monitor the growth of banking and capital market institutions to make sure that these do not get afflicted by the ailments from which similar institutions in developed market economies have suffered in the recent past.

5.11 KEY WORDS

Saving/Savings : Saving represents that part of national product that has not been used up in consumption. It is usually expressed as a percentage of GDP where upon it is indicated as 'rate of saving'. Savings, on the other hand, refers to the 'stock of saving' representing the availability of saving at a particular point of time.

Investment : Refers to expenditure incurred on acquisition of capital goods

Net Capital Inflow : Is the difference between 'net domestic capital formation' and 'net domestic savings'.

Industrial Classification: The economy is classified into nine broad industries. These are: (i) agriculture & allied (ii) mining & quarrying, (iii) manufacturing and repair, (iv) electricity, gas and water, (v) construction, storage & communications, (vi) trade, hotels & restaurants, (vii) transportation, storage & communications, (viii) financing, insurance, real estate and business services, and (ix) others (e.g. law & order, judiciary, educational, health and personal services).

5.12 SOME USEFUL BOOKS

1. Reserve Bank of India, Report on Currency and Finance 2006-08, Vol. I and Vol. II.
2. Government of India, Economic Survey, 2007-08.
3. Planning Commission, Eleventh Five Year Plan: 2007-12.

5.13 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1. See sub-section 5.2.1

Resources for Development

2. See sub-section 5.2.2
3. See sub-section 5.3.2
4. See sub-section 5.3.2

Check Your Progress 2

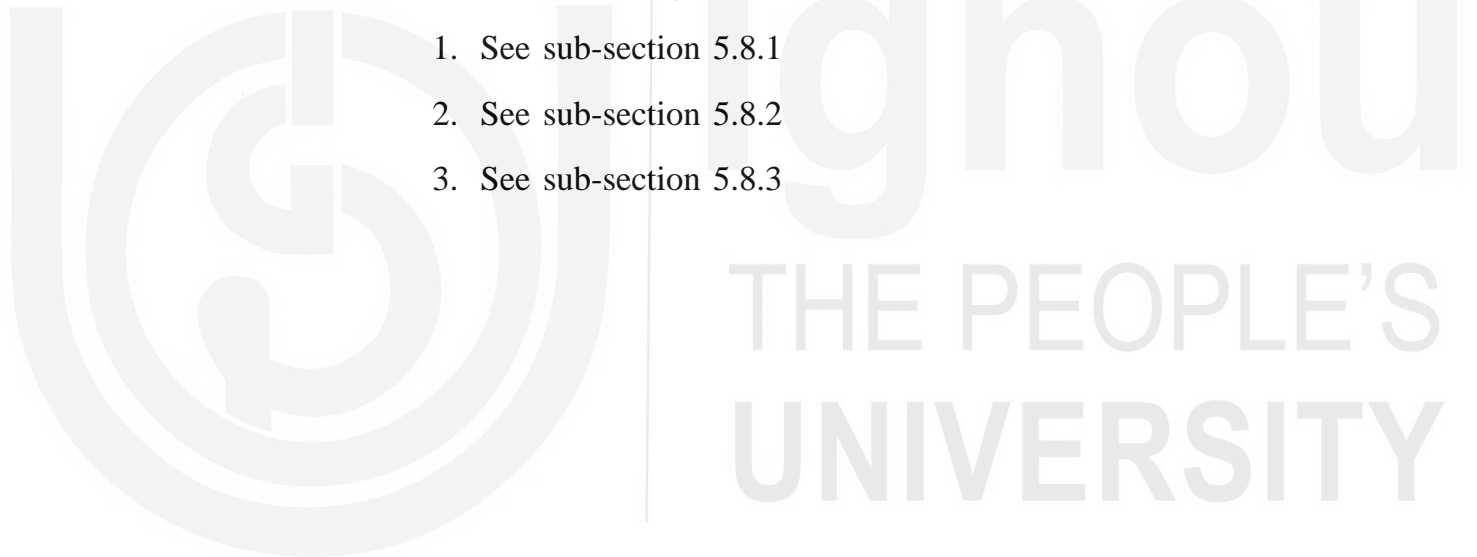
1. See section 5.4
2. See sub-section 5.4.1
3. See sub-section 5.4.2

Check Your Progress 3

1. See sub-section 5.7.1
2. See sub-section 5.7.2
3. See sub-section 5.7.3

Check Your Progress 4

1. See sub-section 5.8.1
2. See sub-section 5.8.2
3. See sub-section 5.8.3



UNIT 6 PHYSICAL NATURAL AND ENVIRONMENTAL RESOURCES

Structure

- 6.0 Objectives
- 6.1 Introduction
- 6.2 Physical and Natural Resources
 - 6.2.1 Land
 - 6.2.2 Water
 - 6.2.3 Forests
 - 6.2.4 Minerals
- 6.3 Energy Resources
 - 6.3.1 Sources of Energy
 - 6.3.2 Nature of Energy Problem
 - 6.3.3 Energy Policy
- 6.4 Infrastructure
 - 6.4.1 Transport and Roads
 - 6.4.2 Ports
 - 6.4.3 Communication
- 6.5 Let Us Sum Up
- 6.6 Key Words
- 6.7 Some Useful Books
- 6.8 Answers or Hints to Check Your Progress Exercises

6.0 OBJECTIVES

After reading this unit you will be able to:

- 1 discuss the availability, utilisation and issues associated with the different type of physical and natural resources in India;
- 1 explain the sources of energy and the policy for augmenting its supply to aid the growth targets in the country; and
- 1 discuss the infrastructural availability and its adequacy vis-à-vis the policy initiatives to improve the same in India.

6.1 INTRODUCTION

Natural resources, as conventionally understood, include all those objects and products that human labour, combined with inputs of capital and enterprise, can extract from nature and make use of them to produce goods and services. Natural resources are not static but dynamic in their nature i.e. they keep on changing. As the process of economic development gathers momentum, the demand for natural resources increase. In such a situation, it becomes critical that the exploitation of natural resources is avoided keeping in view the interests of future generations. In other words, 'sustainable development' should be the goal.

Transport, communication and energy constitute the most important part of economic infrastructure. The different modes of transport, that have evolved with a premium on greater speed, point out to how the world is positioned on the fast changing time-space-speed vectors. Distances are measured on the basis of speed and not in spatial terms. In all these, consumption of energy is the single most important parameter that distinguishes a developed economy from that of a developing economy.

In this unit, we examine the state of the Indian economy in the context of these resources and their adequacy or otherwise to meet the growing needs of a rapidly developing economy.

6.2 PHYSICAL AND NATURAL RESOURCES

Land, water, forests and minerals are four important sources of resource critically used in economic process. In this section (6.2) we deal with each one of these four resources, before we move on to the energy and infrastructural resources in the subsequent two sections, 6.3 and 6.4, respectively.

6.2.1 Land

The total land area in a country sets definite limits within which the process of economic development needs to be organised. As this process advances, the demand for land increases vis-a-vis new and better use for land recognised. Economic theory tells us that this shift is from the agricultural use to the non-agricultural uses. More specifically, the non-agricultural uses are for industrial, construction and trading purposes. In the case of a developing labour-surplus agro-based economy, the pressure on land used predominantly for agricultural processes, is a matter of serious concern. Nonetheless, any diversion of land from agricultural to non-agricultural uses disrupts not only the agricultural supplies but also the very way of life of those engaged in farming. Such a shift or change carries the potential of adversely affecting the entire process of growth. Therefore, in the face of increasing requirements of land, what is generally stressed is that the inaccessible, wasteland and

the land which have hitherto been lying unutilised, should be focussed upon and made serviceable for agricultural and non-agricultural uses.

It is in this context, that statistics relating to the land utilisation pattern become significant. These help to determine the contours of future development as far as the availability of land resources is concerned.

Pattern of Land utilisation

The pattern of land utilisation in India is indicated in Table 6.1. The available land, on the basis of its use, is classified into two parts, viz. (i) agricultural land, and (ii) non-agricultural land.

Table 6.1: Land Utilisation in India

(Million hectare.)

Use	Area
1. Area under non-agricultural uses	23.57
2. Barren and uncultivable land	19.26
3. Net sown area	141.10
4. Forest lands under good tree cover	69.41
5. Miscellaneous tree crops and groves	3.37
6. Cultivable wastelands	13.66
7. Current fallow (i.e. land currently left unutilised)	14.80
8. Old fallow	10.19
9. Permanent pastures and grazing grounds	10.90
Total *	306.25

* total geographical area for which land utilisation statistics are available

(i) Agricultural Land: It includes net sown area, current fallows and land under miscellaneous tree crops and groves. Agricultural land in India totals a little over 50 percent of the total geographical area in the country. This is the highest among the large and medium-sized countries of the world. This indicates:

- a) the influence of favourable physical factors (like size, extent of plains and plateaus, etc.) and
- b) the extension of cultivation to a large proportion of the cultivable land.

But, because of the large population of the country, the per capita arable land (i.e. land suitable for agriculture) is low: 0.16 hectares against the world average of 0.24 hectares, and only one-fourth of that in US (0.67 hectares). The per capita arable land in some other countries are: Australia (2.75 hectare), Canada (1.53 hectare), Brazil (0.33 hectare), etc.

About 15% of the sown area is multi-cropped (i.e. sown more than once in a year). While, most of the multi-cropped area is irrigated, only one-fourth of the gross cropped area is irrigated. The security provided by the irrigation facilities is a major factor in intensive application of labour and other inputs to obtain high yields.

- i) Non-agricultural land:** This includes (i) land under forests and permanent pastures, (ii) land under other non-agricultural uses (towns, villages, roads, railway, etc.) and (iii) land classified as cultivable waste as well as barren and uncultivated land of mountain and desert areas.

Trends in Land Utilisation

Two important changes in the land utilisation pattern witnessed during the last five decades are as follows:

- A. Reclamation of waste and fallow lands:** Reclamation of waste and fallow land was relatively rapid during the 1950s, following land reforms, such as the abolition of Zamindari and Jagirdari systems. The dispossessed Zamindars reclaimed land which had been left to them for 'personal cultivation' while their former tenants reclaimed waste and fallow lands to which they had acquired rights. The process was aided by loans and subsidies from the government.
- B. Significant increase in the area sown more than once:** The 'area sown more than once' has also shown a significant increase during the last five decades. Also, the (a) demand for land in non-agricultural uses is constantly increasing, and (b) a further increase in net sown area may not be feasible. It is, thus, imperative that attention is paid towards an improvement in agricultural technology. This should make it possible to raise three to four crops a year as many other countries are doing. With the new agricultural strategy having very much come to stay, the objective should be within easy reach.

Perspectives

It is clear that as the total supply of land is a fixed factor, what is required is an effective rationing of land among the varied users. As far as possible, no further encroachments on cultivable land should be allowed. This requires priority to be given to the use of only non-cultivable land for non-agricultural uses. This will not only save cultivable land for agriculture, but will also promote balanced regional development.

6.2.2 Water

Water is another basic important resource. It is also an important source of energy. About 25% of electricity generated in the economy is from the hydel sources. The other important use of water is in irrigation. In a country where agriculture gives sustenance to a large proportion of population, provision of water for irrigation can make crucial difference i.e. it can either stimulate the economic activity or depress it altogether.

Sources of Water

The important sources of water can be classified into two parts: (i) surface water, and (ii) ground water. Surface water is available from rivers, lakes, etc. Ground water is available from wells, springs, etc. Other sources of water which have not yet been tapped but represent a potential source are: saline lakes, saline springs, snow and ice-fields. Surface water sources are replenished by rainfall. Surface water is available in the form of vast network of rivers available in the country.

Rivers

The rivers in India may be classified as follows:

- i) The Himalayan rivers are generally snow fed and have, therefore, a continuous flow throughout the year. During the monsoon months, the Himalayas receive heavy rainfall and the rivers discharge the maximum amount of water causing frequent floods.
- ii) The Deccan rivers are generally rain-fed and, therefore, fluctuate in volume.
- iii) The Coastal streams, especially of the west coast, are short in length with limited catchment area. Most of them are non-perennial (i.e. not long lasting).
- iv) The streams of the inland drainage basin of Western Rajasthan are few with most of them of seasonal character.

Thus, although India possesses many reservoirs of water, they are inadequate as compared to the requirements. A UN report ranks India 133rd in a list of 180 countries for its poor water availability. It also ranks India 120th for water quality in a list of 122 countries. A recent World Bank report also estimates the per capita availability of water in India as 1,185 cubic metres (cm) as against 9,628 cm in the US, 3,371 cm in Japan, and 2,183 cm in China.

Issues Relating to Water

The principal issues relating to water are as follows:

- i) increased demand for water from all sectors;
- ii) lack of a rational water pricing policy impacting demand adversely;
- iii) widespread conflicts over groundwater across the country;
- iv) inefficient management of conflicts by policies and institutions mandated to solve the conflicts; and
- v) new conflicts arising within states.

Groundwater is under serious threat of overuse in many parts of India. 360 districts have reported declining water level of over 4 metres during the past 20 years. In nearly one-third of the blocks in the country, ground water reserves have been or are close to drying-up and this figure is estimated to cross 60% in another 25 years. In this context, four interconnected programmes assume significance:

- i) watershed development programme;
- ii) renovation of all water bodies linked to agriculture which have fallen into disuse;
- iii) correcting the deterioration of public irrigation works, notably state canal systems, arising due to cumulative neglect of maintenance and repair over the years, and
- iv) rain water harvesting.

Check Your Progress 1

1. Briefly outline the trends in land utilisation in India during the last five decades.

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2. Mention in brief the different sources of water in India.

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3. What are the different water related issues in India?

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6.2.3 Forests

Forests produce the raw materials for industries, defence, communications, domestic use and other public purposes. They contribute to the country's exports generating a large volume of employment in the primary, secondary and tertiary sectors. They also provide materials like

fuel wood, small timber, fodder, etc. for direct use of many rural families. The benefits from forests in the matter of soil conservation, recreation, wildlife, etc. are well recognised.

Forests occupy about 711.03 lakh hectares, or about 23.68 percent of the total geographical area. Of this, dense forest category (i.e. 40 percent or more of the area covered by trees) amounts to about 58.0 percent.

Among the states, Madhya Pradesh has the maximum forest area of 77,265 sq. km., followed by Arunachal Pradesh (68,045 sq. km.) and Chattisgarh (56,448 sq. km.).

The area under forests in India is low as compared to the forest area in countries like Sweden (66%), Japan (64%), South Korea (63%), and USA (25%). It is also much less than the norm of 33% of the total reporting area recommended in the National Forest Policy of 1952.

The per capita forest land in India is less than 0.06 hectares as against the world average of 2.06 hectares. Further, the productivity of Indian forests is very low: 1.2 m³ (cubic meters) per hectare as against the world average of 2.1 m³. The demand for forest products is likely to increase fast in future. It is therefore necessary to review comprehensively the national forest policy, so as to ensure the attainment of 33% land area under forests on the one hand and a substantial improvement in forest productivity on the other.

6.2.4 Minerals

The mineral resources of India encompass a wide range of products which are necessary for a modern developed economy. According to the Geological Survey of India, there are 50 important minerals in 400 major sites in the country.

Minerals in India can be divided into four categories as follows:

1. Minerals of which India's exportable surplus can dominate the world market (e.g. iron-ore and mica);
2. Minerals of which the exportable surplus forms an important factor (e.g. manganese ore, bauxite, gypsum and others);
3. Minerals in which it appears that the country is self-sufficient (e.g. coal, sodium salts, glass sand, phosphates, bauxite, etc.);
4. Minerals for which India has to depend largely (or entirely) on foreign markets (e.g. copper, nickel, petroleum, lead, zinc, tin, mercury, platinum, graphite, etc.).

Minerals provide a base for the rapid industrialisation of the economy. The change over to an open market economy has opened up further

avenues for faster industrial growth requiring greater quantity of minerals. The geological setting of the country holds great promise for a boom in mineral production. However, for this, there are a few essential aspects that need to be worked into a proper mineral policy. The New Mineral Policy (2007) has noted these factors which are as follows.

- i) The mineral resources are very unevenly distributed.
- ii) The country is deficient in certain minerals like crude oil or petroleum, a large part of the present demand of which is being met by imports. In view of the rising prices of these minerals in international markets, it would be necessary to curb their growing use in the economy on the one hand, and make sustained efforts to explore the domestic sources of supply of these minerals on the other.
- iii) There are minerals which are lucrative foreign exchange earners. Efforts should be made to devise a suitable policy to have a proper utilisation of these minerals in the national interest.
- iv) The mining industry is mired in obsolete technology which need to be tackled.

Check Your Progress 2

- 1. Write a few lines on the present position of forests in India?
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- 2. Briefly mention the present position of minerals in India.
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- 3. Mention the important aspects that need be worked into a proper Mineral Policy in India.
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6.3 ENERGY RESOURCES

The need for energy in a developing economy needs no emphasis. It is a basic input required to sustain the economic growth and also to provide basic amenities of life to the entire population of a country. It is energy which is the dividing line between a subsistence economy and a developed economy. In the affluent United States, an average American consumer consumes nearly 40 times as much energy as an average Indian does. Annual consumption of commercial energy in kilograms (kg) of oil equivalent per capita in India is estimated at 513 (kg) as against 7,943 (kg) in USA. Empirically, it has been established that inadequate supplies of energy can inhibit development whereas even an assurance of an adequate supply can be a great stimulus to development.

6.3.1 Sources of Energy

Energy in India is produced from different sources. These can be classified into two groups as follows:

1. commercial sources - thermal power, hydel power, power from oil, gas, nuclear, etc. and
2. non-commercial sources - like firewood, dung cakes, etc.

Of the two sets of sources, commercial sources occupy a more prominent position. Electricity generation has increased from 264.2 billion kwh in 1990-91 to 662.50 billion kwh in 2006-07. The relative contribution of the different sources to electricity generation is provided in Table 6.2.

Table 6.2: Electricity Generation by Sources

(billion kwh)

Year	1990-91	2000-01	2006-07
Hydel	71.6	74.5	85.00
Thermal	192.6	408.1	537.40
Nuclear	-	16.9	17.68
Total	264.2	499.5	662.50

Presently, about 80% of total electricity is generated by thermal sources which has also made big progress in production since 1990-91. Further, nuclear energy has appeared on the scene, although, as yet it makes a small contribution.

The bulk of the commercial energy is consumed by the industrial sector followed by the transport and household sectors. A large part of the energy requirement in the rural and domestic sectors is met from non-commercial sources. The relative share of non-commercial energy is

expected to fall over the next decade. The energy requirements of the economy is expected to multiply by two to six times over the next decade depending upon the rate of growth of the economy. Even if India achieves a nominal annual average rate of growth of 5 percent, the per capita consumption of energy is expected to multiply by about 2.5 times. It is therefore imperative to accord high priority to power generation.

6.3.2 Nature of Energy Problem

By 'energy problem' we mean the problem of providing fuels for energy generation. It also includes its viable generation i.e. transmitting and distributing the energy produced at reasonable cost to those who need them, wherever they are.

The adverse energy situation is reflected from the reduced level of self-sufficiency in oil, widening gap between power demand and supply, the declining share of hydel power in total power generation, increasing dependence on oil imports and insignificant commercialisation of non-traditional sources of energy.

At present, India faces an energy shortage of 8% and a peak load shortage of 11.6%. With an estimated elasticity coefficient of 0.95, for an annual 8% growth in GDP, the demand would translate to 7.6% annual growth in electricity generation. In order to meet this demand, our power generation capacity would have to increase more than six times by the year 2032.

6.3.3 Energy Policy

For a healthy development of the power sector, the following factors need to be kept in view:

1. Minimise investment costs to enable better utilisation of available financial resources by opting for the low-cost production methods and technologies;
2. Minimise net outflow of resources, especially foreign exchange;
3. Minimise costs of energy production to bring about economies in power supply and keep power tariff at affordable levels without having to resort to heavy and unsustainable subsidisation; and
4. Maximise security of power supply by insulating from external and international events of catastrophic nature.

In pursuance of these objectives, various measures taken by the state can be divided into two parts viz. (a) energy pricing measures, and (b) non-pricing measures.

A. Energy Pricing Measures: Policies adopted in India under the energy pricing measures have aimed at the following:

- i) meeting the energy needs of low income consumers on a priority;
- ii) encouraging the shift from oil products as source of energy generation to domestically produced fuels;
- iii) providing pricing subsidies to sectors such as agriculture and specific industries to keep the energy prices low; and
- iv) priority for general price stability avoiding frequent and abrupt adjustments in energy price levels.

The trend in the recent pricing decisions is one in which the burden of increased import prices were passed on fully and, by and large, equitably to all stake holders.

B. Non-Pricing Measures: These include the following.

- i) On the demand side, efforts have been towards regulation and management of energy demand, as also to improve the efficiency of energy use in different sectors of the economy.
- ii) On the supply side, efforts have been intensified for larger production of both crude oil and refined products, as also of alternative sources of energy, both conventional and non-conventional.
- iii) The other important steps have been:
 - 1 improving asset utilisation
 - 1 reducing transmission losses
 - 1 encouraging power generation by the private sector
 - 1 promoting low voltage equipments, largely to industrial sector and public utilities. Increasing the production of low voltage equipments which, in turn, is related to: (a) investment in technology and availability of power for production; and (b) level of investment needed in production units having a bearing on growth in the industrial sector in general.
- iv) In 2002, the Accelerated Power Development and Reforms Programme was launched. It has since become the focal point of reforms in the distribution segment.
- v) Power Grid Corporation is implementing the National Power Grid Projects. The project is estimated to cost Rs. 80,000 crore and is scheduled to be completed by 2012. Under this project, all the existing power grids will be integrated to form a national grid which will be accessible from any point in the country. This will help in shifting the excess power to power-deficit states.
- vi) India Power Fund has been set up with the aim of:

- 1 facilitating expeditious completion of power projects;
 - 1 accelerating investment in power sector; and
 - 1 promoting competition in line with the Electricity Act, 2003.
- vii) Non-conventional energy is increasingly considered as a long-term strategy. A threefold strategy has been pursued in this respect which includes:
- a) providing budgetary resources from the government for demonstration projects;
 - b) extending institutional finance for commercially viable projects, with private sector participation and foreign assistance;
 - c) promoting private investment through fiscal incentives, tax holidays, depreciation allowance, and remunerative price for the power supplied to the grid.
- viii) Private sector participation is also being allowed in renovation and modernisation of hydro and thermal power projects. For this purpose, detailed guidelines have been laid down. These guidelines envisage three options which include: (i) lease, rehabilitate, operate and transfer (LROT), (ii) sale of plant, and (iii) joint venture between state electricity boards and private companies.

6.4 INFRASTRUCTURE

Infrastructure covers those supporting services that help the growth of directly productive activities like agriculture and industry. These services include a wide range starting from the provision of health services and education facilities to the supply of such needs as power, irrigation, transport, communication, etc. The subjects of health and education are separately covered in a later unit (unit 24) of your present course. Here we are dealing with some of the later mentioned services.

Infrastructure and Economic Growth

Infrastructure has a two-way relationship with economic growth. One, infrastructure promotes economic growth, and two, economic growth brings about changes in infrastructure. The first, the forward linkage, between infrastructure and economic growth, derives from the following factors:

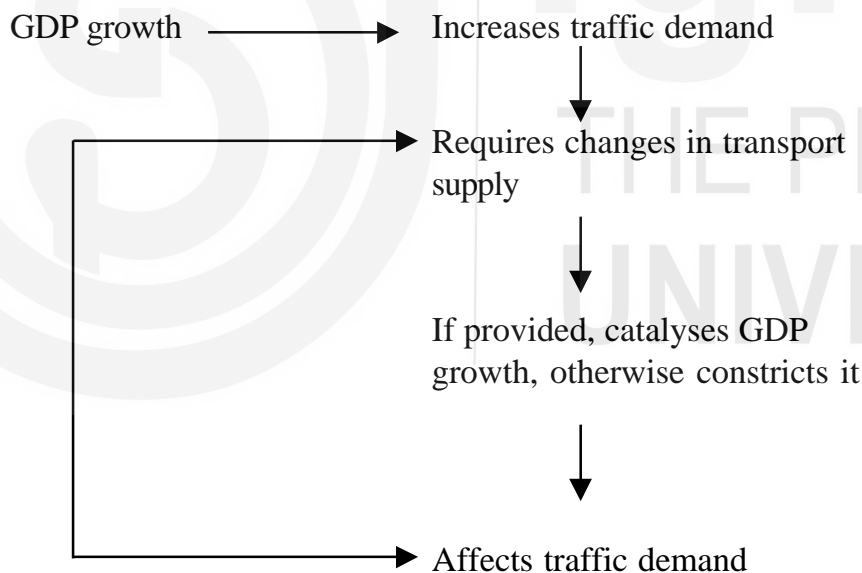
- i) Output of infrastructure sectors such as power, water, transport, etc. are used as inputs for production in the directly productive sectors viz. agriculture, manufacturing, etc. Therefore, insufficient availability of the former results in sub-optimal utilisation of assets in the latter.
- ii) Infrastructure development such as transport improves productivity significantly.

- iii) Infrastructure provides the key to modern technology in practically all sectors.
- iv) A close association between infrastructure and GDP growth is observed in many studies. These studies have indicated that 1% growth in the infrastructure stock is associated with 1% growth in per capita GDP.
- v) Studies have also revealed that generally around 6.5% of the total value added is contributed by infrastructure services in low income countries. This proportion increases to 9% in middle income countries and 11% in high income countries.

Thus given the above type of linkage, infrastructural development is important not only for economic growth, (vis-a-vis globalisation and technological innovation in manufacturing) but also for poverty reduction.

Second, the backward linkage, between economic growth and infrastructure, derives from the following.

Growth, in turn, makes demands on infrastructure. This can be illustrated with the help of the relationship between GDP growth and demand for infrastructure, as follows:



As a result, with increase in income levels, the composition of infrastructure changes. For instance,

- a) In low income countries, basic infrastructure such as water, irrigation are more important.
- b) In middle income economies, demand for transport grows fast.
- c) In high income economies, power and telecommunications occupy more importance. Due to such linkages between infrastructure and the rest of the economy, efficiency, competitiveness and growth of

the economy hinges upon the state of development in the infrastructure sector.

Studies have indicated that with a 20 percent sustained increase in public investment in infrastructure, the government can accelerate real growth by 1.8 percentage points in the medium to long term i.e. six to ten years. This is further estimated to accompany a 0.2 percentage decline in the rate of inflation with the increase in resulting income leading to a 0.7 percentage point annual reduction in poverty in rural India. This shows the potential for achieving the much-debated 8-9 percent aggregate real GDP growth in the Indian economy.

In the rest of the present section of the unit we will focus on a few select aspects of infrastructure like roads, ports and communication.

Check Your Progress 3

1. What are the different sources of energy in India? What is the relative importance of different sources of commercial energy?

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2. Outline the objectives of an appropriate energy policy in India.

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3. What are the various initiatives taken by the government to solve the energy problem in India?

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4. State in brief the relationship between infrastructure and economic growth.

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6.4.1 Transport and Roads

Transport System and Efficiency: Linkage

The transport system in India (for that matter any country) is dependent on many important supporting services. The different modes and services on which the broad transport system depends are: railways, roads, ports, inland water transport, coastal shipping, airports and airlines. Railways and roads are the dominant means of transport in India carrying more than 95% of total traffic in the country. Although other modes such as coastal shipping and inland water transport also play a crucial role, the railways and roads dominate the transport land scape in the country.

It is necessary to foster the development of the various transport modes so that they together lead to the realisation of an efficient, sustainable, safe, and regionally balanced transportation system in an integrated manner. Since each mode of transport operates in its particular field of economy, such an integrated development facilitates the evolving of a 'competitive and non-discriminatory price structure' crucial to support the progressive development of 'transport infrastructure' in the country. In other words, it would enable the realisation of comparative advantages of economic efficiencies to be properly reflected in the user costs.

The liberalisation of the economy has instilled the urgency of recognising the necessity of an efficient transportation system for increasing productivity and enabling the country, in the process, to compete effectively in the world market. Adequate and reliable transport infrastructure (and services) are important factors which contribute to enhancing the ability of the country to increase its international trade attracting foreign direct investment. The government has a major role to play in this sphere because, for the success of a market economy, the economic base that the governments provide for the transport sector largely determines the cost of services. It is, therefore, necessary to create a policy environment that encourages co-ordination between alternative modes of transport in order to provide an integrated transport system with maximum efficiency and minimum cost.

Road Network: Importance, Magnitude and Policy Thrust

A good road network is a critical infrastructure requirement for rapid growth. It facilitates the growth process by providing: connectivity to remote areas; accessibility to markets, schools and hospitals; and opening up backward regions to trade and investment. Roads also play an important role in inter-modal transport developments establishing links with airports, railway stations and ports.

The components of India's road network consist of: (i) national highways (NH), (ii) state highways (SH), (iii) major district roads (MDRs), and (iv) rural roads (RR) including other district roads and village roads. The NHs (with a total length of 66,590 km) comprise only 20% of the road

network but carry 40% of the road traffic. SHs (with a length of about 1,37,000 km) and MDRs (with a length of 3,00,000 km) together constitute the secondary system of road transportation contributing significantly to the development of the rural economy and industrial growth of the country. The secondary system also carries about 40% of the total road traffic, although it constitutes only about 13% of the total road length (33.14 lakh kms) in the country. RRs (comprising the large residual of 28.1 lakh km length), once adequately developed, hold the potential to provide the vitally needed rural connectivity for generating higher agricultural incomes and productive employment opportunities besides promoting access to economic and social services.

The road network is, thus, grossly inadequate offering poor riding quality. In order to improve the situation, besides speedy implementation of projects like the Golden Quadrilateral (GQ) and the North-South and East-West (NS-EW) corridors, addressing the deterioration in large stretches of NHs and other improvements in the road network are being accorded high priority in the planning process. A road development programme has been drawn up with the following objectives:

- i) Develop roads as an integral part of transport system, supplementing other modes, with high priority being accorded to balanced development of road network (primary, secondary and tertiary systems).
- ii) Expedite implementation of national highways development programme (NHDP).
- iii) Phased removal of deficiencies in existing NHs concomitant with development of traffic over the next 10-15 years.
- iv) Formulate comprehensive master plans for development of 15,600 km of access-controlled expressways.
- v) Prioritise development of high-density corridors in SHs/MDRs.
- vi) Promote private sector participation for development of the national and state road networks.
- vii) Achieve Bharat Nirman target of providing rural connectivity through all-weather roads to all habitations with a population of 1000 plus persons (500-plus in hilly/tribal areas) by 2009 thereby improving the quality of life in rural areas and ensure balanced regional development.
- viii) Focus on proper upkeep and maintenance of the existing road network and on attaining higher maintenance standards for optimum utilisation of existing network capacity and preserving road assets already created. For this, adopt modern management techniques for scientific assessment of maintenance strategies/priorities.

- ix) For priority road safety, prevent overloading of trucks, encroachments, unplanned ribbon development, etc.
- x) Focus on issues like energy conservation and environment protection.
- xi) Provide world-class wayside amenities along highways.
- xii) Reduce transportation costs by maintaining better riding surface, use of containers, multi-axle vehicles in the haulage of goods, etc.
- xiii) Ensure road connectivity where rail link is not possible.
- xiv) Integrate road development with railways and other modes of transport.
- xv) Develop a road data bank by computerising project monitoring system and promoting the use of information technology in the road sector.

6.4.2 Ports

Ports constitute the inter-modal interface between maritime and land (road & rail combined) transport. India has a coastline of around 7,517 km with 12 major ports and 187 notified non-major (minor/intermediate) ports along its coastline and sea islands. Almost 95% by volume and 70% by value of India's global merchandise trade is carried through the sea route. In 2006-07, the 12 major ports handled about 73% of the maritime cargo of the country. The balance 27% was handled by the non-major ports. Overseas cargo accounts for about 77% of the total cargo handled at Indian ports.

Issues in Port Development

There is immense potential for modernisation and growth of Indian ports. The main problem is that, due to pressure from trade unions, the government has not been able to modernise the major ports. As a result, Indian ports are highly over manned making a direct effect on efficiency. Political pressure, lack of autonomy, absence of incentives, excessive bureaucracy, and hierarchical rigidities are contributors to the current state of the Indian ports.

Compared to the larger international ports, India lags behind badly. For instance, the largest port in the world in Hong Kong, processes more than 20.01 million TEUs (20-foot equivalent units) in a year. The tenth largest port, Antwerp, processes about 5.4 million TEUs. In contrast, the Jawaharlal Nehru Port (JNP), India's largest container port, handles only about 2 million TEUs. There are also problems with the average pre-berthing time, which is in the range of 11 hours, and the average turnaround time, which is around three days. In Singapore, for instance, the corresponding numbers are 3 hours and half a day respectively. These

low performance indicators are primarily because of the poor road and rail container evacuation infrastructure from the port.

Recent Policy Initiatives in Port Development

The **first** imperative is to decongest leading ports like the JNP (in Navi Mumbai) and improve the rail and road connectivity of others. Improving the productivity of the existing ports by adding to their capacity is the key policy objective. Towards achieving the former, new kinds of contracting arrangements are being made. The latter problem is also being addressed albeit slowly.

Secondly, given the shortage of public funds, private participation is now being solicited. Around \$ 800 million have been invested so far by foreign firms. The eventual potential is estimated at around \$35 billion. To make this possible, policies and procedures have been significantly liberalised. The areas identified for private participation are: (i) leasing of existing assets of port, (ii) allowing for creation of additional assets such as the construction and operation of container terminals, (iii) construction and operation of bulk, break bulk, multipurpose and specialised cargo berths and warehousing facilities, and (iv) improving container freight stations, storage facilities and tank farms, handling equipment, and dry docking and ship repair facilities.

Thirdly, by amending the 1963 Major Ports Trust Act, a tariff authority for major ports has been set up.

Fourthly, the government has also decided to give a boost to coastal shipping by setting up a string of minor ports along the entire peninsula.

Fifthly, foreign investment cap has been raised up to 51 percent on an automatic basis in support services like operation and maintenance of piers and loading and discharging of vessels. FDI up to 100 percent is permitted under projects for vehicular tunnels, ports, and harbours. The BOT model is being used for private sector participation, with the assets created reverting to the port after the concession period. Major ports have been permitted to form joint ventures with foreign ports, minor ports, and other companies to attract new technology and better management practices. Concessional import duty has been allowed. A ten-year tax holiday has been extended under the Income Tax Act.

Check Your Progress 4

1. Briefly explain the present position of roads in India.

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2. State in brief the objectives of road development programme in India.

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3. Mention the recent policy initiatives for development of ports in India.

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6.4.3 Communication Network

Development of world-class telecommunication infrastructure is the key to rapid economic and social development of the country. Driven by various policy initiatives, which include New Telecom Policy (NTP) - 1994 and later the NTP-1999, the Indian telecom sector has witnessed a complete transformation in the last decade. During this period, it has achieved phenomenal growth and is poised to bring about further accelerated growth with the modernisation plans laid down to bring the country in line with those of other developed countries.

Present Status of Telecom Network

The telecom services network has expanded from about 84,000 connections (fixed line) at the time of independence to about 206.83 million working connections as on March 31, 2001 (consisting of 40.77 million fixed telephone lines and 166.05 mobile phones). India's present 207 million robust telephone network is one of the largest in the world and second largest among the emerging economies (after China). With a wide range of services such as basic, cellular, internet, paging, very small aperture terminal (VSAT), etc. the status of the present telecom network is impressive. Table 6.3 presents some related facts on the status of telecom network in India.

Table 6.3: Telecom Network Status in India

1. Number of telephone connections	20,683 million
2. Number of telephone exchanges	38,388
3. Switching capacity (public)	88.82 million
4. Village public telephones (VPTs)	564,610
5. Rural phones	2,26,55,691

Resources for Development

6. Wireless subscribers	166.05 million
7. Internet connections	9.21 million
8. Broadband subscribers	2.28 million
9. Optical fibre route length (public)	5,19,155 route km.
10. Microwave route length (BSNL)	64,506.64 km.

Although the telecom sector has grown rapidly in India, viewed in the context of global growth pattern and indicators, it needs to achieve more in terms of tele-density. A positive correlation between the tele-density and the GDP of a country is observed in empirical investigations as the growth in the telecommunication sector has linkages with the growth of other sectors in the economy.

New Initiatives in Telecommunication Sector

It has been seen that broadband penetration has a multiplier effect on the economy. Experience has shown that broadband penetration has a positive correlation with the national income of the country.

Keeping this in view, a need to put in place an appropriate internet-broadband policy is recognised. Major aspects of such a policy framework are identified as follows:

- 1. Pricing Policy:** India has a highly price-sensitive market. If the price is right, the acceptance of a service or good is also high. The telecommunications market has amply proven this fact. Bandwidth, if looked at as a commodity, needs to be priced rightly for bringing in the desired take-off. Reselling of bandwidth for domestic usage should be allowed as it is recognised to create competition leading to expansion of infrastructure.
- 2. Fiscal Policies:** The following aspects need to be considered on the fiscal policy front:
 - (a) Encouragement of low-cost access devices;
 - (b) Decreased duties on items used in broadband networks and equalisation of duties on inputs for domestically manufactured goods comparable with those on finished import products; and
 - (c) Providing appropriate tax structure to enable growth without foregoing revenue to government.
- 3. Co-ordination between PSUs:** The public sector major BSNL should be encouraged to co-ordinate with the consortium of PSUs to identify the additional villages that could be provided broadband connectivity by utilising the latter's infrastructural base. For this, suitable financial incentives should be evolved to facilitate the coordination programme.

1. State the present status of telecom network in India.

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2. What policy initiatives are suggested for the rapid growth of telecommunication network in India?

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6.5 LET US SUM UP

Adequate availability of good quality physical, natural and infrastructural services is an essential prerequisite for rapid economic development. India has been blessed with varied natural resources rich in volume and content. However, it has not been possible to exploit them due to non-availability of adequate financial resources and appropriate technology. The growth process in the Indian economy has been severely constrained by infrastructural inadequacies. Concerted policy initiatives and well-formulated programmes have been initiated to overcome these limitations in the Indian economy.

6.6 KEY WORDS

- Sustainable development** : Adopting growth strategies by consuming the available natural resources in such a manner that its consumption by the present generation does not deprive the future generations of its availability.
- Fallow land** : Unplanted or unirrigated land.
- Infrastructure** : Covers those supporting services like energy, water, roads, railways, ports, etc. that help the growth of directly productive activities like agriculture and industry.
- Ports** : Important infrastructure at sea coasts providing inter-modal interface between maritime and land transport systems.

6.7 SOME USEFUL BOOKS

1. Planning Commission: Eleventh Five Year Plan 2007-2012.
2. Kaushik Basu (ed.): The Oxford Companion to Economics in India, Oxford University Press, New Delhi, 2008
3. Ishwar C. Dhingra: The In(kg)(kg)dian Economy, Environment and Policy, 2009.

6.8 ANSWERS OR HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1. See sub-section 6.3.2
2. See sub-section 6.4.1
3. See sub-section 6.4.3

Check Your Progress 2

1. See sub-section 6.5.1
2. See sub-section 6.6.1
3. See sub-section 6.6.1

Check Your Progress 3

1. See sub-section 6.7.1
2. See sub-section 6.7.3
3. See sub-section 6.7.3
4. See sub-section 6.8.1

Check Your Progress 4

1. See sub-section 6.9.1
2. See sub-section 6.9.2
3. See sub-section 6.10.2

Check Your Progress 5

1. See sub-section 6.11.1
2. See sub-section 6.11.2

UNIT 7 DEMOGRAPHIC FEATURES

Structure

- 7.0 Objectives
- 7.1 Introduction
- 7.2 Size of Population
- 7.3 Growth of Population
- 7.4 Vital Rates
- 7.5 Demographic Transition
- 7.6 Urbanisation
- 7.7 Sex Ratio
- 7.8 Population Pyramid
- 7.9 Dependency Ratio
- 7.10 Population Ageing
- 7.11 Demographic Window or Dividend
- 7.12 National Population Policy (NPP) - 2000
- 7.13 Let Us Sum Up
- 7.14 Key Words
- 7.15 Some Useful Books/References
- 7.16 Answers/Hints to Check Your Progress Exercises

7.0 OBJECTIVES

After going through this unit, you should be in a position to:

- 1 define the important concepts used in demographic analysis;
- 1 explain the importance of vital statistics in developmental planning;
- 1 discuss the progress made by India in respect of the demographic indicators during the past six decades of planning since independence;
- 1 indicate the initiatives taken by the government in regard to its current population problems;
- 1 outline the objectives and the targets in its current National Population Policy; and
- 1 provide an assessment of the urgent steps needed to be taken in order to reap the benefits of demographic dividend.

7.1 INTRODUCTION

Population contributes an important factor-input, namely, labour, to the development process. It is also the ultimate beneficiary of development. The demographic features of a country relate to the size of population, its structure in terms of different characteristics, distribution by regions, changes in these over time and space and factors that influence these or are affected by these, etc. A demographic profile of India can be prepared with the help of census data. A census is conducted every ten years in our country. The last such census was conducted in the year 2001 with March 1st as the reference date. The present unit provides a detail of the conceptual aspects related to the important demographic features of India.

7.2 SIZE OF POPULATION

India's population according to the 2001 census was 1028.74 million (a million is equal to 1,000,000 i.e. 10 lakhs). India is the second most populous country in the world, the most populous being China. India, with only 2.4% of the world area, accounts for 16.9% of the world's population, while China, with nearly 7% of the world area, accounts for 21% of the world's population. The corresponding shares of the United States of America are 5% and 7% respectively. Clearly, India and China have more people living in a smaller area than is the case with USA. In other words, the USA has a smaller *density of population* than India and China.

Density of population is defined as population per square kilometre (sq. km.) of land area. Thus:

$$\text{Density of Population} = \frac{\text{Population}}{\text{Land Area}}$$

The density of population in India is 325. The population of India is not distributed uniformly within the country. Some areas in the country like Delhi (density - 9340), Kerala (919) and West Bengal (903) are more densely populated than others. Hilly areas like Arunachal Pradesh (13), Jammu & Kashmir (109), Himachal Pradesh (109) and Uttaranchal (159) and territories with large forest areas like Andaman & Nicobar Islands (43), Chattisgarh (154) and Madhya Pradesh (196) and the State with a desert, namely, Rajasthan (165) are more sparsely populated than others. Normally, fertile areas, industrial areas and areas in and around an administrative capital or, in general, areas where economic activities abound, tend to be densely populated. This is because these areas provide a relatively larger number of opportunities for earning a livelihood than others and thus exert a *pull* on the population of other areas.

7.3 GROWTH OF POPULATION

The size of the population of a given area changes over time through (i) migration and (ii) natural factors like *births and deaths*. *Migration* consists of two components: *emigration or out-migration and immigration or in-migration*. The difference between emigration and immigration is called *net migration*.

Net migration is negligible at the national level in India and the growth in India's population is, therefore, mainly due to natural increase.

We are usually interested in finding out how fast the size of the population is changing over time. The population in India was 361.0 million in 1951; it increased to 439.2 million in 1961, 548.1 million in 1971, 683.33 million in 1981, 846.30 million in 1991 and 1028.74 million in 2001. Thus, the population increased by about three times in a course of five decades. In absolute size therefore, the population of India has been continuously increasing. But what is significant is that the rate of growth of population has come down in recent years. *The ratio of the increase in population over a specified period to the initial population (defined as base year population), or the relative increase to the initial population, expressed as a percentage, is called as the rate of growth of population during the period.* Thus, if we denote the population of an area in the initial period as P_0 and the population of the same area at time 't' as P_t and the rate of growth of population during the period 0 to 't' as R_t , we have

$$= \frac{P_t - P_0}{P_0} \times 100$$

$$\text{or } R_t = \{(P_t / P_0) \times 100\} - 100$$

Growth rate of India's population, estimated as above, came down from a high of 23.85% during the decade 1981-91 to 21.34% during the decade 1991-2001. Note that the two growth rates viz. 23.85% and 21.34% are the growth rates over the corresponding 10 year periods. In practice, it is common to come across the growth rates expressed as average annual growth rate (AAGR). The AAGR for the first period 1981-91 is 2.4% and for the second period 1991-01 is 2.1%, obtained by simply dividing the decadal growth rates by 10.

Check Your Progress 1

1. Are the following statements "true" or "false"?
 - a) India is the most populous country in the world.
 - b) Hilly areas tend to be densely populated.

- List the factors that affect the size of the population of an area over time.

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- The population of a country was 340 million in 1961 and 425 million in 1971. What is the rate of growth of population over the period 1961-71? What is the AAGR?

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7.4 VITAL RATES

We noted earlier that births, deaths and migration are the three events that determine the growth of population. A number of other factors influence these events. One set of such factors are: age at death or longevity, prevalence of diseases, health care facilities available, levels of health and nutrition and other factors. The second set of factors are those that influence the number of children born to women during the reproductive period of their life (that is, fertility), like for example their age at marriage. The third set of issues relate to the ‘pull’ and ‘push’ factors that lead to immigration and emigration respectively. We now define some important vital rates (or statistics) relating to births (i.e.fertility) and deaths. Most of these vital rates are defined as *rates per thousand of population per annum* because the rates are too small to be expressed as percentages.

7.4.1 Fertility Rates

Crude Birth Rate: *The Crude Birth Rate (CBR) in any year (and area) is defined as the number of live births in that year (and in that area) per thousand population. Thus,*

$$\text{Crude Birth Rate} = \frac{\text{Number of live births in a year}}{\text{Population in a year}} \times 1000 \quad \dots (7.1)$$

Trends in CBR in India in the last century show that the CBR has come down from 49.2 during the decade 1901-11 to 39.90 during 1941-51, 25.8 in 1991-2001 and 23.5 in 2006. The main reasons for this decrease are the promotion of family planning programmes by government and

increasing awareness among the people of the benefits of adopting a small family norm. As a result, the average annual rate of *gross* additions to population has come down from 49.2 per thousand or 4.92% during the period 1901-11 to 25.80 per thousand or 2.58% in 2001.

Although CBR has come down further to 23.5 in 2006, it is still high and varies widely across states. It varies from 13.1 in Manipur to 30.1 in Uttar Pradesh. The central belt consisting the five states of Rajasthan, Madhya Pradesh, Uttar Pradesh, Bihar and Orissa, where CBR is high even in 2006, calls for concerted efforts to bring down the CBR as this is bound to have a substantial impact on the national birth rate.

Why is the CBR still high? Let us list the major factors responsible for this:

- i) The infant mortality rate (see below) is high in India and parents, therefore, tend to have more children in the hope that at least some of them will survive;
- ii) There is a deep-rooted, traditional preference for sons in India, who, people believe, will provide security to parents in old age. This leads Indian parents to wish for a male child even if they already have one or two female children;
- iii) Children are often considered economic assets, especially in agricultural and business families, where they can help the families by working in farms and small businesses and reduce labour costs and generate additional income;
- iv) Lack of awareness among many parents about available modern methods of birth control and termination of pregnancies;
- v) A mindset that considers methods in (iv) above a taboo; and
- vi) Age at marriage in India is often low, despite legislation raising it to 18 for girls and 21 for boys, and, therefore, the reproductive period in marriages is still longer than desirable.

General Fertility Rate

The Crude Birth Rate, as the name indicates, is only a rough estimate of fertility. Note that the number of births in a year in the area (i.e. numerator in the formula 7.1) is compared with the entire population of the area, that is, people of all ages and further, both males and females. It would be appropriate to compare the number of births with the population of females of childbearing age group 15 – 49 (or 15-44 depending upon the levels of fertility in the area) to measure fertility. If we replace the denominator in CBR by the mid-year population of females aged 15-49 in the area in the year, we arrive at a more refined measure of fertility, namely, the *General Fertility Rate (GFR)*. It is thus the number of births

per year per thousand women of childbearing age (aged 15-49) and is calculated as:

$$\text{GFR in any year} = \frac{\text{Number of live births in a year}}{\text{Total female population aged 15-49}} \times 1000 \dots (7.2)$$

But fertility levels vary with age too. It would, therefore, be desirable to refine the fertility measure further by assessing fertility levels at different ages or by computing *Age-Specific Fertility Rates (ASFR)*. The ASFR for any age group is the number of live births per woman to the mid-year female population of a particular age group. The ASFR is thus given by:

$$\text{F(X to X + n) in any year \& area} = \frac{F(X, X + n)}{\text{Total female population in age group (X to X + n)}} \dots (7.3)$$

where, F(X, X + n) is the ASFR for the age group (X to X + n).

For example, F(25 to 29) is the ASFR for the age group (25 - 29) and F(25) is the ASFR for women at age 25. Note that the ASFRs are not expressed as per thousand rates but merely as fractions as it refers to the number of live births per woman in the specific age-group.

Total Fertility Rate

An important measure of fertility is the *Total Fertility Rate (TFR)*. It is the number of live births per woman completing her reproductive life, where the reproductive life for a woman is taken to be the age group 15-49 or 15-44, depending upon the levels of fertility in an area.

TFR was estimated to be 5.2 for India in 1971 but is estimated to have come down to 3.6 in 1991 and further to 3.0 in 2002.

Kerala had a TFR of 1.8 in 1991 whereas the TFR for the four states of Uttar Pradesh, Bihar, Madhya Pradesh and Rajasthan was at least 4.4 in 1991. TFR in these four states, even in 2002, ranged between 3.8 and 4.4. Such a high value for TFR means that at the current prevalent age-specific fertility rates, a woman in these four states would add, on an average, 3.8 to 4.4 children to the population before she completes her reproductive life. This would have a sizeable impact on the country's population growth in the coming years, as these four states together account for 36% of the total population of the country in 2001.

TFR is thus an important variable for controlling population growth. Although TFR has been brought down to the level of 3 for the country in a span of 30 years, it is still high enough to cause concern. Focused action needs to be taken on reducing fertility, especially in the four states mentioned above. It is for this reason that these four states along

with Orissa (with TFR 2.6 in 2002 and a 4% share of India's 2001 population) have been grouped together for *empowered action designed to reduce fertility rates in these states (called EAG – Empowered Action Group - states)*. One of the important targets set for the Eleventh Five Year Plan (April, 2007 to March, 2012) is to bring down the value of TFR for the country to 2.1 by the end of the Eleventh Plan period. It is interesting to know at this juncture that China has fared better in its efforts to bring down its TFR to 1.85 in 1995, due to the one child per family policy adopted by China since 1979.

7.5.2 Mortality Rates

The *Crude Death Rate (CDR)* or the *Crude Mortality Rate (CMR)* in any year in an area is defined as the number of deaths in the year per thousand population of the area. That is:

$$\text{Crude Mortality Rate or Crude Death Rate in any year and area} = \frac{\text{Number of deaths in the year}}{\text{Population in the year}} \times 1000 \quad (7.4)$$

The overall death rate reflects the overall health status of the area at any point of time. It also gives the rate at which the population of an area gets reduced in a year. While CBR gives the *gross* natural additions to population per annum per thousand population in an area, CDR represents the natural deductions from the population per annum per thousand population of the area.

CDR in India has declined from a high rate of 48.6 per annum per thousand during 1911-21 to 8.5 in 2001 and further to 7.5 in 2006. In other words, the annual rate of natural reduction in population has come down from 4.86% to 0.75% over the period 1911-2006. The CDR in 2006 varies from 6.7 in Kerala to 9.3 in Orissa. Manipur with a CDR of 4.5 is in an even better situation than Kerala.

Natural Growth Rate of Population

The difference between CBR and CDR represents the natural growth rate of population. The CDR, in India, has declined steadily with its decline being *steeper* than that in CBR. As a result, the rate of natural increase in population has increased over the period 1931-2001 from 1.01% per annum to 1.73% per annum. Natural growth rate per annum in 2006 varied between 0.8% in Kerala and 2.2% in Bihar. As mentioned earlier, the states at the top end of the BR and TFR range, namely, the EAG states, need to be given special attention.

Age-Specific Death Rates (ASDR)

Death occurs at all ages and the risk of mortality varies with age. It would therefore be necessary to analyse death rates for populations at

different ages or age groups by calculating *Age-Specific Death rates (ASDR)* defined as follows:

$$D(X \text{ to } X+n) \text{ in any year \& area} = \frac{\text{Number of deaths in age group } (X \text{ to } X+n) \text{ in a year}}{\text{Population in age group } (X \text{ to } X+n)} \times 1000 \quad \dots(7.5)$$

where $D(X \text{ to } X+n)$ is the ASDR for the age group $(X \text{ to } X + n)$. When $n = 0$, this reduces to $D(X)$, the ASDR at age X . For example, $D(20 \text{ to } 24)$ is the ASDR for the age group 20 – 24 and $D(20)$ is the ASDR at age 20.

Infant Mortality Rate

Children face a greater risk of mortality (i.e. deaths) than adults, especially during the first year of their life. The health status of infants, that is those who are less than 12 months old, is an important indicator of the levels of health care and medical facilities available in an area and needs to be monitored. The *Infant Mortality Rate (IMR)* is defined as the number of infants dying under one year of age in a year in an area per thousand live births of the same year and area. That is,

$$IMR \text{ in any year \& area} = \frac{\text{Number of infants dying under one year of age in a year in an area}}{\text{Number of live births in the same year and area}} \times 1000 \quad (7.6)$$

IMR for India was estimated as 129 in 1971. It has declined to 57 (62 in rural areas and 39 in urban areas) in 2006. It varies widely across states. At the lower end are Manipur (11), Kerala (15) and Goa (15) and at the upper end are Madhya Pradesh (74), Orissa (73) and Uttar Pradesh (71). The wide variation in levels of health care across states would be clear from these figures.

Expectation of Life

Expectation of life at birth (e^0_0) is the average number of years a new-born child is expected to live under current mortality conditions. Expectation of life can be estimated at any age. For example, *expectation of life at age five is the average number of years a child aged 5 today is expected to live.* Thus *expectation of life at age ‘t’ is the average number of years a person aged ‘t’ years today is expected to live.*

Expectation of life at birth for India has increased from 41.3 years in the period 1951-61 to 55.5 years in 1981-85 and further to 60.7 years in 1992-96. It varied (in 1992-96) from 55.2 years in Madhya Pradesh to 59.5 years in Rajasthan among the EAG states. It was the highest in Kerala (73.1) and 63.7 in Tamil Nadu.

7.5 DEMOGRAPHIC TRANSITION

The demographic experience of the countries that are currently called 'developed' countries show that countries pass through *three stages of demographic transition*:

First State : high birth rates and high death rates;

Second Stage : high birth rates and low death rates; and

Third Stage : low birth rates and low death rates.

In the first stage of demographic transition, which usually coincides with a low level of development, the birth rate as well as the death rate is very high. The rate of growth of population (birth rate – death rate) is, therefore, very low. The rate of growth of population in India for example was low up to 1921, although the birth rate and the death rate were quite high. *India can thus be considered to have been in the first stage of demographic transition up to 1921.*

As a country develops, the standard of living, the nutritional and health status of people, housing and sanitation will all improve and death rates register a decline. The experience of developing countries shows that the major cause for such a decline in death rates is not so much due to industrialisation as to advances made in medicine. The birth rate is however not influenced as quickly by these developments as the death rate as it depends on values, culture, tradition and awareness of people and on the advantages of a small family. It, therefore, continues to remain high and, even if there is a decline, it is much less than the rate of decline in the death rate. The difference between the birth rate and the death rate thus increases and the rate of growth of population is high in this second stage of demographic transition. This is also the phase of *population explosion*. In India, the death rate declined sharply from 48.6 per thousand of population during 1911-21 to 8.5 during 1991-2001 and to 7.5 in 2006. The birth rate on the other hand stayed at levels above 40 during most of the period 1921-71 and above 30 during the period 1971-91. Even thereafter, it has been above 20. As a result, population has registered an accelerating rate of growth till 1971. Although the *rate* of growth of population has come down somewhat after 1971, it still continues to be high. India's population almost doubled between 1951 and 1981 and nearly trebled between 1951 and 2001. *India is still in the second stage of demographic transition.* Pakistan and Bangladesh are also in this stage of demographic transition.

Low birth rates and death rates are the characteristic features of the *third stage of demographic transition*. As a country's economy develops, there is a rise in the standards of living, improvement in female literacy, rise in age at marriage, there is a wider awareness and desire among people regarding the adoption of small family norms, etc. These lead to a reduction in the birth rate. With death rates already low, the rate of

growth of population declines to lower levels than before. Most of the currently developed countries like the USA and Japan are in the third stage of demographic transition. *Some states in India, like Kerala and Tamil Nadu, can be said to have reached the third stage of demographic transition.*

Check Your Progress 2

1. Why is the mid-year population used in the denominator of the formula for computing CBR and CDR?

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2. Why is TFR considered a better measure of fertility than CBR?

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3. It is said that in our efforts to bring down fertility we should focus especially on the five EAG states: UP, Bihar, MP, Rajasthan and Orissa. Why?

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7.6 URBANISATION

Urbanisation is a process that influences the rural-urban distribution of population in a country. People live in cities, towns and villages. Individuals and families migrate from one place to another, especially from villages to towns and cities for various reasons.

Urban population increases by:

1. natural increase of the urban population;
2. migration from rural areas; and
3. transformation of rural areas into urban areas through
 - a) upgrading of places into new towns through notifications;

- b) establishment of new industrial townships; and
- c) growth of urban agglomerations.

The share of urban population, in India, has increased from about 11% in 1911 to about 28% in 2001. In other words, the rate of urbanisation has increased over the years and the urban population has grown faster than both the rural and total populations. Roughly three out of ten Indians live in an urban area.

The rate of urbanisation has, however, been uneven across the states. The Union Territory of Delhi is the most urbanised with as much as 93.18% of its population living in urban areas. Goa is the most urbanised among the states with almost one half of its population living in urban areas. The least urbanised state is Himachal Pradesh (9.3%) and the least urbanised Union Territory is Dadra & Nagar Haveli (22.89%).

Urbanisation is considered beneficial because of better opportunity for earning higher incomes, better infrastructure and better awareness and response of people to social issues in general. Urbanisation thereby contributes to modernisation and social change. The birth rate, the death rate, IMR and fertility rates are lower in urban areas than in rural areas.

However, urbanisation is not altogether a blessing. Shortage of land, the growing gap between the demand and supply of basic facilities and services (e.g. housing, water supply, sanitary services, electricity, roads, public transport, etc.) and finally, massive environmental pollution in cities, adversely affect the quality of urban life. The total slum population in cities, especially in mega and metro cities, have been increasing. As per the 2001 census, India had 42.6 million slum population accounting for about 15% of the country's total urban population. However, it is also a fact that the slum population in cities and towns provide several essential services to the urban populace although the levels of their access to basic services are very poor.

The basic factors responsible for rural-urban migration are rural poverty and the declining levels of livelihood opportunities in villages. The latter, in particular, is due to the falling public investment in agriculture. Policies designed to provide rural areas with housing, water supply & sanitation, electricity, health and medicare services at levels comparable to urban areas, better road connectivity, etc. should be initiated so that 'pull' factors of urban areas and 'push' factors of rural areas are both weakened. The National Rural Employment Guarantee Act (NREGA, 2005) gives a legal guarantee to provide 100 days of employment in a year to one member of every rural family. Likewise, Sarva Siksha Abhiyan (SSA) is an educational programme aimed at ensuring access to education to all children in the school going age-group (i.e. 6-14 years). The emphasis in the Tenth and the Eleventh Five Year Plans are on rejuvenation of the agricultural sector. These are some recent steps of the government to reduce rural-urban migration.

7.7 SEX RATIO

Population is made up of males and females of different ages. The structure of the population in terms of gender and age-structure have implications for efforts to be made by government and society in areas of education, health services, housing, employment generation, public services like transport, electricity, sanitation, etc. These also influence the present and future rates of growth of population as also the pace of economic development.

The gender composition of the population is measured by the *sex ratio*, defined as the number of females per thousand males. It has been observed that females outnumber males in developed countries. India's sex ratio, however, shows a preponderance of males. However, the sex ratio has declined from 972 in 1901 to 933 in 2001. It also varies widely across states; it varies from 1058 in Kerala to 861 in Haryana and among Union Territories, from 1001 in Puducherry (Pondicherry) to 710 in Daman & Diu. The declining trend in the sex ratio in India has been due to a number of factors like:

- a) progressive undercount of women in successive censuses;
- b) the low status of women in society;
- c) discrimination against women in almost all spheres of life including a minimum level of nutrition, access to health, education and other services and amenities;
- d) female illiteracy;
- e) neglect of the female child and girls; and
- f) the deep rooted preference for sons to daughters leading to heinous practices like female infanticide and female foeticide.

Efforts to promote gender equality through emphasis on education of girls, empowerment of women, legislation to prevent domestic violence against women, ban on the use of scans and other techniques to determine the sex of the foetus, etc. have been mounted to tackle these issues in the recent years.

7.8 POPULATION PYRAMID

The detailed picture of the age-sex structure of the population is called the age pyramid or the population pyramid. The population pyramid consists of horizontal bars representing age groups in ascending order arranged one upon another like a pyramid. The length of the horizontal

bar of an age group measured from the central axis represents the number of males/females in the age group or the percentage of males/females in the age group to total male/female population. *Absolute pyramids* show the differences in the overall size of the total population in the respective age-sex group. *Percentage pyramids*, on the other hand, depict the *relative* differences in the population size in each age-sex group.

Chart 1: Age Pyramid – India : 2001
(Ref: Table 1)

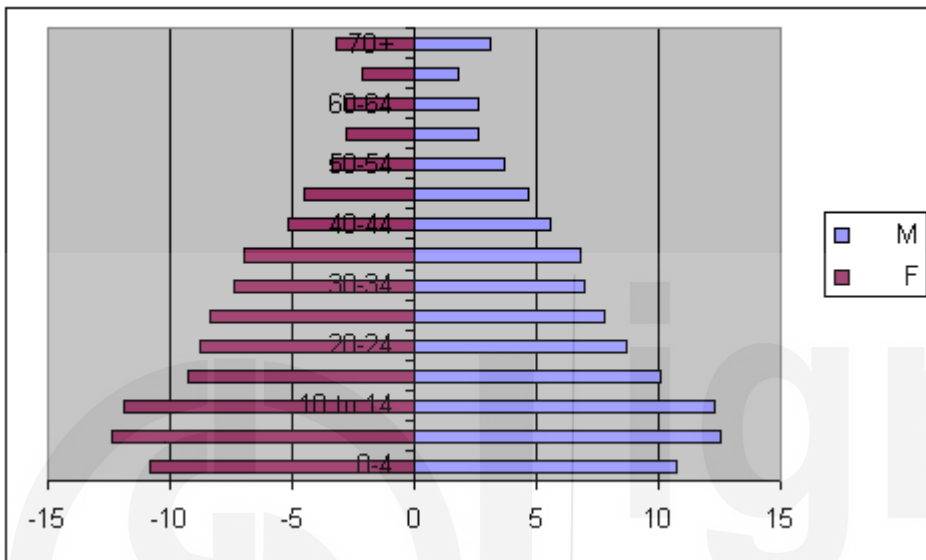


Chart 2: Age Pyramid – Kerala : 2001
(Ref: Table 1)

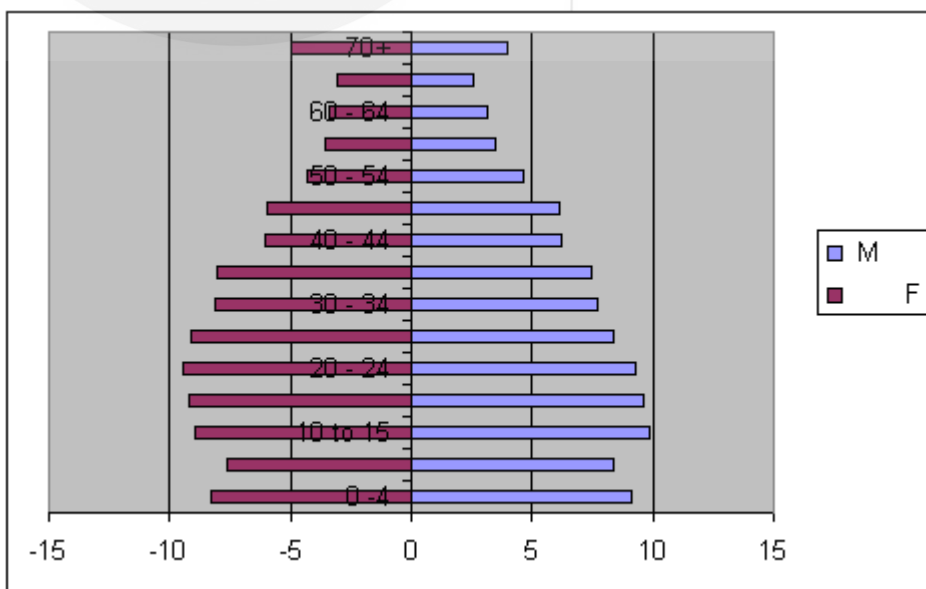


Table 1 Age Structure of Population – India: 2001

(percentages)

Age Group	India			Kerala		
	P	M	F	P	M	F
(1)	(2)	(3)	(4)	(5)	(6)	(7)
0-4	10.74	10.73	-10.74	8.68	9.11	-8.28
5-9	12.47	12.54	-12.40	7.99	8.37	-7.62
10-14	12.14	12.33	-11.93	9.38	9.85	-8.94
15-19	9.74	10.14	- 9.32	9.37	9.60	-9.16
20-24	8.73	8.71	-8.75	9.37	9.31	-9.43
25-29	8.11	7.81	-8.43	8.75	8.38	-9.10
30-34	7.22	7.02	-7.43	7.90	7.67	-8.13
35-39	6.86	6.77	-6.96	7.75	7.47	-8.01
40-44	5.42	5.62	-5.21	6.13	6.21	-6.05
45-49	4.61	4.67	-4.54	6.05	6.15	-5.95
50-54	3.56	3.73	-3.37	4.52	4.68	-4.35
55-59	2.69	2.55	-2.83	3.55	3.50	-3.59
60-64	2.67	2.55	-2.81	3.24	3.11	-3.37
65-69	1.92	1.78	-2.08	2.83	2.58	-3.07
70-74	1.43	1.42	1.45	1.93	1.77	2.08
75-79	0.64	0.61	0.66	1.26	1.12	1.38
80+	0.78	0.74	0.83	1.22	1.02	1.41
*A.N.S.	0.27	0.28	0.25	0.08	0.09	0.07
All ages	100.00	100.00	100.00	100.00	100.00	100.00
Median age in years	22.81			27.98		
DR I**	0.76			0.58		
DR II@	0.68			0.50		

* Age Not Stated (A.N.S)

** Dependency Ratio I = (population aged 0-14 and 60+)/ (population aged 15-59). A.N.S. is included in the age group 60+ in this calculation.

@ Dependency Ratio II = (population aged 0-14 and 65+)/ (population aged 15-64). A.N.S. is included in the age group 64+ in this calculation.

Source: Based on C-Series Tables, Census 2001 – Office of the Registrar General, India.

Data on age structure (say) by five-year age groups and by sex are useful in many ways.

- i) Children, i.e. those aged 0 – 14 years, consist of two groups. The first consists of those in the age group 0 – 4, or those nurtured at home and the second, aged 5 – 14, or the school going group. The size of the population in the age group 5 – 14 gives us an idea of the scale of the primary and secondary school facilities to be created and the resources required for the task.
- ii) The population in the age group of 15-19 or 15-24 is relevant to estimate the likely size of the higher education facilities required. The size of the female population aged 15-44 or 15-49, is relevant to estimate the fertility levels of women in the reproductive age-group.
- iii) The size of the age group 15-59 (or 15-64) indicates the work potential of the economy.
- iv) The age group 60 and above (or 65+) provides the size of the task for ensuring the geriatric care for our senior citizens.

Age distribution by five-year age groups can also be used to derive the ten-year age group distribution. The latter enables us to trace the movement of the population in each ten-year age group through successive censuses. For example, survivors from the population in the age group 0–9 in one census will make up the age group 10–19 in the next census, provided the migration in the population during the intervening period of the two censuses is negligible.

7.9 DEPENDENCY RATIO

Children and elders, that is, those in the age groups of 0–14 and 60+ are expected to be taken care of by the working age population 15-59. The age structure of the population by age groups 0–14, 15–59 and 60+ enables us to look at the population in terms of the size of the working age population *relative to* the size of those dependent on the earnings of the working age population. Some use the age groups 15-64 and 65+ instead of 15-59 and 60+.

The ratio of dependents (population in the age groups 0–14 and 60+) to the working age population (age group 15–59) is called the dependency ratio (DR). This indicates the burden per member of the working age group population. A favourable dependency ratio tends to boost savings. This is of course possible only if the working age population is productively employed.

The Dependency Ratio for India has come down from 0.92 to 0.76 between 1971 and 2001. Kerala is much better off in this respect with a DR of 0.58 in 2001. This is because the proportion of children in the country's population has come down over the period 1971-2001 and the proportion of children in Kerala's population is smaller than the proportion at the national level.

7.10 POPULATION AGEING

Data on age structure of the population over the years help us to study, among other things, 'population ageing'. *Population ageing occurs when the median age or the mean age of the population rises.* The median age of the population is that age which divides the population in to two halves so that those in the top half are of median age or older and the age of those in the bottom half is less than the median age.

The median or mean age of the population rises when the proportion of children, that is, those in the age group 0–14 falls and expectation of life or the longevity of the population rises. This is the result of falling fertility and death rates over a period of time.

The median age of the Indian population has risen from 19.60 years to 22.81 years between 1971 and 2001. *The population of India has thus aged between 1971 and 2001.* This is because CDR registered a sharp decline, expectation of life at birth rose steadily and TFR fell from 5.2 to 3.1 during the period 1971 to 2001. We can also compare the *ageing* of population across states to understand their relative status of development from their health point of view. The population of Kerala is *aged* compared to the country's population, owing to Kerala's consistently low TFR and CDR compared to the national rates. Expectation of life at birth in Kerala has also been higher than in the rest of the country. According to some estimates, the median age of the world has increased from 29.0 in 1937 to 37.3 in 2000 and is expected to rise to 45.5 in the year 2050. The corresponding figures for the more developed regions of the world are 23.9, 26.8 and 37.8. The median age of the population of China is estimated to have risen from 23.7 in 1950 to 28.3 in 1995.

Check Your Progress 3

1. State three undesirable consequences of urbanisation.

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2. List three reasons for the declining sex ratio in India.

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3. What is the economic significance of the following?

- i) ratio of non working population to working population;
- ii) population size in the age group 6-14;
- iii) population size in the age group 15-59;
- iv) population size of females in the age group 15-49.

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7.11 DEMOGRAPHIC WINDOW OR DIVIDEND

Demographic Window is defined as that period of time in a nation's demographic evolution when the proportion of children and the youth (those aged less than 15 years) falls below 30% and the proportion of people aged 65 years or more is still below 15%. This would imply that the proportion of the working age population (taken as the age group 15-64) would be at least 55%. Thus the working age population would be the predominant part of the population and the dependency ratio (DR) will be utmost 0.82 (i.e. 45 divided by 55). Alternatively, if the shares of the dependent age groups are 27% and 13% respectively, the DR would come down to 0.67.

Societies that have entered the *Demographic Window* have smaller DRs. Such favourable DRs tend to boost savings and investments in human capital, that is, investments required to enhance capabilities and skills and thereby productivity of human resources through education, training, nutrition and health care. A rising share of the working age population in a population constitutes the *demographic dividend* (DD) – indicating a potential that can enhance the rate of growth of the economy.

But this demographic dividend or demographic potential will remain only a potential advantage if the working age population is not fully and productively utilised. This is because low workforce participation rates, especially among women, or rampant unemployment or low of levels of

skills in the workforce may limit the positive impact of such a favourable age structure on economic growth. Note that it is not so much the proportion of the dependents to the working population that is important *but the rising share of the working age population in the total population and the capacity of the economy to productively utilise this potential that are important.*

Typically, this *window of opportunity*, or the availability of the *demographic dividend*, lasts for 30 to 40 years, depending upon the country. The timing and duration of this period is closely associated with those of the decline in fertility levels because of the linkage between fertility levels and the age structure of the population. As birth rates fall, the age pyramid first shrinks, with the shares of age groups below 15 years falling and the age pyramid acquiring a “bulge” in the middle – corresponding to the working age groups. After a few decades, however, the low fertility causes the population to grow older (i.e. the bulge shifts near the top of the age pyramid) and the growing population of elderly people raises the dependency ratio again. Countries that have entered the Demographic Window, therefore, have the demographic potential for high economic growth, provided of course the working age population is skilled and is fully and productively utilised by the economy. Economic policies designed to tap this potential, therefore, assume importance.

Has India reached the demographic window? No, it had not reached till 2001. The proportion of those aged less than 15 years was still above 30% although the proportion of those aged 65 and above was below 15%. *However, it would enter this stage soon and hence steps should be taken urgently to derive the fullest benefit from it.* The share of the working age population is rising (almost 60% now). However, it was not being fully and productively utilised by the economy as about 7.32% of the labour force was unemployed on an average day in the year 2000. Further, roughly one in eight of the youth *labour force* (i.e. those ‘working’ and those ‘not working but available and willing to work’), aged 15-29, was unemployed on an average day. The proportion of unemployed educated youth labour force was still higher (15%). The unemployment rate among the technically educated youth was even higher – 24% in 2000. Although the Indian economy registered annual growth rates of around 8% during 2003-08, a growing shortage of skills have emerged, alongside unemployment and underemployment. Urgent steps are, therefore, required to:

- i) generate employment opportunities on a scale sufficient to eradicate unemployment and underemployment;
- ii) extend the reach of the educational and training system to enable larger sections of the population than now to benefit from it and thereby participate in the development process; and

iii) reform the educational and training system to make it relevant to the emerging needs of the economy.

Only then can we reap the benefits of Demographic Dividend.

7.12 NATIONAL POPULATION POLICY (NPP) - 2000

The need for concerted action to reduce TFR and CBR as early as possible to bring down population growth was emphasised earlier. The NPP 2000 was announced on February 15, 2000 with this aim. A National Population Commission has also been set up under the Chairmanship of the Prime Minister to monitor the implementation of NPP 2000.

The *immediate objective of NPP 2000* is to meet the ‘unmet’ needs for contraception, healthcare infrastructure and health personnel and to provide integrated service delivery for basic reproductive and child health care. The *midterm objectives* are to reduce *TFR to replacement levels* (i.e. 2.1) by 2010 through vigorous implementation of inter-sectoral operational strategies. The *long term objective* is stabilisation of population by the year 2045 at a level consistent with the requirements of sustainable economic growth, social development and environmental protection. The policy has outlined a number of promotional and motivational measures. The more important among these are:

- a) reward panchayats and zila parishads for promoting the small family norm;
- b) strict enforcement of the Child Marriage Restraint Act, 1976 and the Pre-Natal Diagnostics Techniques Act, 1994;
- c) provide funds and soft loans for establishing ambulance services in rural areas;
- d) strengthen the scheme for abortion facilities by the establishment of facilities under trained medical personnel;
- e) establish vocational training schemes for girls leading to their self employment; and
- f) promote setting up of revolving funds for boosting creation of income generating avenues through the activities of village level self help groups (SHGs).

The National Rural Health Mission launched some time back is a step in the direction envisaged in NPP 2000. The TFR, in 2002, for the country as a whole was 3.0. The medium term target set for TFR for 2010 in NPP 2000 has already been shifted to 2012 in the Eleventh Five

Year Plan. Urgent attention also needs to be given to exploit the potential of the demographic dividend that is at our doorstep.

Check Your progress 4

1. Three countries have the following characteristics:

Characteristic	Country A	Country B	Country C
Proportion of population in age group 15-64 to total population	58%	49%	60%
Proportion of population in age group 0-14 to total population	28%	35%	26%
Incidence of unemployment in the age group 15-64	20%	15%	3%

- i) Examine whether these three countries have reached the Demographic Window or not and indicate the reasons for your conclusions.
- ii) Which of these countries can derive the benefits of the resultant demographic dividend and why?

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2. Look at the list of the more important promotional and motivational measures advocated in the NPP 2000 given in Section 7.12. Why do you think that the measure (b) is important?

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7.13 LET US SUM UP

The unit introduced many concepts like birth rate, death rate, fertility rate, mortality rate, demographic transition, urbanisation, population pyramid, dependency ratio, demographic dividend, etc. Besides indicating their usefulness as crucial developmental parameters, the trends in them

for India were presented to show the extent of development achieved during the last six decades of planning since independence and the challenges that lie ahead. The salient features of the National Population Policy – 2000 were presented towards the end to reveal the commitment of the government in this regard.

7.14 KEY WORDS

- Population density** : population *per* square kilometre.
- Crude Birth Rate** : number of live births in a year in an area *per* thousand of population of the area.
- Crude Death Rate** : number of deaths in a year in an area *per* thousand of population of the area.
- Infant Mortality Rate** : number of infants dying before their first birthday in an area *per* thousand live births.
- Replacement level TFR** : The TFR level at which a woman has an average of one daughter during her reproductive life (to replace herself in the population). This TFR level will then have to be 2.1 to take into account (i) mortality and (ii) the excess of boy births over girl births.

7.15 SOME USEFUL BOOKS/REFERENCES

Cassen, R.H. (1978): *India : Population, Economy, Society*, Chapter 4, The Macmillan Co. of India Ltd., Delhi.

Dutt, R. and KPM Sundharam (2001): *Indian Economy* (Chapter 4), S.Chand & Co., New Delhi.

Dhingra I.C. (2009): *The Indian Economy : Environment and Policy* (Chapter 5), Sultan Chand & Sons, New Delhi.

Government of India (2000): *National Population Policy*, Ministry of Health & Family Welfare, New Delhi.

————— (2008): *Eleventh Five Year Plan (2007 – 12)*, Planning Commission, New Delhi.

Information on Census and vital statistics can be accessed at <http://www.censusindia.net>

7.16 ANSWERS/HINTS TO CHECK YOUR PROGRESS EXERCISES

Check Your Progress 1

1. (a) false (b) false.
2. See para 1 of Section 7.3.
3. Growth rate 25%; AAGR 2.5%.

Check Your Progress 2

1. See para following formula 7.1.
2. In measuring fertility, CBR relates the total number of births to the entire population consisting of males and females of all age groups. TFR takes note of age specific variations in fertility. It also relates the number of births to the female population in the reproductive age group 15-49.
3. See paragraph on TFR in Section 7.4.1.

Check Your Progress 3

1. See the penultimate para of Section 7.6.
2. See para 2 of Section 7.7
3. See Sections 7.8 and 7.9.

Check Your Progress 4

1. Take Country A. The proportion of children is $< 30\%$ and the proportion of 65+ is $(100 - 28 - 58) = 14\%$. A is therefore at DW. But with 20% unemployment it will not be able to benefit from the DD. Try out the others. B has not reached the DW. C has reached and can benefit from it.
2. See Sub-section 7.4.1, especially the portion on trends in CBR and Section 7.7.

UNIT 8 NATIONAL STATISTICAL SYSTEM

Structure

8.0 Objectives

8.1 Introduction

8.2 The National Statistical System

8.2.1 Collection of Data on Selected Aspects of the Economy

1 Population and Vital Statistics

1 Crop Area and Production

1 Industrial Production

1 Prices

8.3 National Statistical Commission (NSC)

8.4 Functions of Important Statistical Agencies in India

8.5 International Perspective of Statistical Data

8.6 Let Us Sum Up

8.7 Key Words

8.8 References

8.9 Answers/Hints to CYP Exercises

8.0 OBJECTIVES

After going through this unit, you should be in a position to

- 1 explain the importance of 'statistical data' as an input for developmental planning;
- 1 describe the National Statistical System in India that has evolved over time;
- 1 specify the data collected on select aspects of the economy like population and vital statistics, agricultural and industrial statistics and prices;
- 1 state the functions of important statistical agencies in India; and
- 1 provide an international perspective of statistical data.

8.1 INTRODUCTION

So far we have been discussing the different types of resources required for development. While discussing these resources, you would have

realised the need for *quantification, measurement and comparison over time and space* to have a meaningful understanding of the resource endowment of the country. Without appropriate statistical data on variables relevant to the development process, people responsible for decisions would have to work on the basis of *guesses and impressions*, leading to failures of policies and shortfalls in the achievement of developmental objectives. *Statistical data* thus constitute an essential *resource* input for economic development. Let us, therefore, have a look at the present statistical system in India and also make an assessment of its adequacy in terms of our requirements.

8.2 THE NATIONAL STATISTICAL SYSTEM

The Statistical System of independent India has been shaped essentially by the federal structure of the Indian constitution. The constitution divides the administrative functions between the government of India and the state governments by classifying subjects into three categories – *the Union, the states and the Concurrent Lists*. Subjects in the Union list are assigned to individual union ministries/departments. Likewise, those in the states list are allotted to individual departments of state governments, while the subjects in the concurrent list are covered by both the central and the state governments. The collection of statistics relating to any subject is generally the responsibility of the department concerned. Several union/state government entities, therefore, have full-fledged statistical divisions or cells as part of their administrative set up. In such a set up, statistical data emanates by and large from the states to the union government except in the case of national surveys. The Indian statistical system is thus a system that is built upwards: from the village to the block, from the blocks to the district and from the districts to the state government department concerned and from it to the union ministry/department concerned. It is thus a collection of state level systems forming a national statistical system.

In an effort to build up and strengthen the national statistical system the necessary institutional structures were created in the early 1950s. These comprise institutions like the Central Statistical Organisation (CSO), the National Sample Survey Organisation (NSSO), State Directorates of Economics and Statistics (SDES), etc. These institutions, together with the Registrar General's office responsible for the conduct of decennial censuses which was in existence even before the independence, constitute the important organs of the national statistical system in India.

8.2.1 Collection of Data on Selected Aspects of the Economy

The Indian statistical system collects an enormous amount of data on a wide variety of aspects of the economy. We will confine our focus here on data relating to (i) population and vital statistics, (ii) crop production, (iii) production of industrial goods and (iv) prices.

Statistics on (i) population and its various characteristics and (ii) vital events – births and deaths – are important for analysing different aspects of population. *The Registrar General of India and Census Commissioner (RGI & CC)* is the authority concerned with the collection, processing and analysis of data on both these aspects. RGI & CC conducts **Population Census** every ten years. *A census is the complete enumeration of all members of a universe or population.* The history of population census in India goes back to 1872 when the results of censuses conducted in different parts of the country around that time were aggregated. The first complete population census was conducted *simultaneously* throughout the country in 1881. Thereafter, the population censuses (or simply the census) have been conducted at decennial intervals. The scope of the census has expanded over the years, taking note of data needs of development planning. The latest census relates to 2001 and the next is due in 2011. The reference date for the census is usually the 1st of March. The census collects a vast amount of data on the social, economic, demographic, cultural and geographic aspects of the population, the households and the basic facilities to which these households have access.

Vital statistics flow from the **vital registration system** in which the local authority records the births and deaths that occur in the community. However, as all births and deaths do not get reported, the coverage of the vital registration system remains incomplete. In order to overcome this shortcoming, a scheme known as the **Sample Registration System (SRS)** – was launched in 1970 to provide statistically valid estimates of births and deaths in the country. The SRS surveys a sample of the population on a continuous basis generating data helpful in forecasting the size, distribution and growth patterns of the population. The enactment of the *Compulsory Registration of Births and Deaths Act, 1969*, is a major step towards ensuring complete coverage of the registration of vital events. The reporting habit is improving particularly because the production of birth and death certificates is now compulsory for a number of purposes like addition of names in the ration card, school admission, employment, inheritance and settlement of property, etc. The SRS provides data at national and state levels and for regions within states. Another emerging source of vital statistics is the database generated by the *National Family Health Surveys (NFHSs)*. With three such surveys conducted so far – relating to the years 1992-93, 1998-99 and 2005-06, the NFHSs provide data up to the state level.

II Crop Production

Significance of Data on Crop Production

Reliable and timely data on crop production have manifold significance. Important among these are:

Resources for Development

- i) They are of importance to planners and policy makers to bring about efficient agricultural development and take decisions on procurement, storage, public distribution, imports and exports and related matters.
- ii) Such data would be needed at fairly disaggregated levels, down to village *panchayat* levels, in the context of decentralised planning.
- iii) Government needs to make forecasts of production, as production data take time to materialise. Also, in order to take decisions well in advance about pricing of agricultural commodities, distribution, imports - where necessary - and exports - where possible, such forecasts would be needed.

India has a well established, decentralised system for the collection, compilation and dissemination of data on crop production and related matters. It consists of: (i) Directorate of Economics and Statistics in the Ministry of Agriculture (DESMOA), (ii) the State Agricultural Statistics Authorities (SASAs), and (iii) the Village Revenue Agency. Most of the country has cadastral (see Key Words) survey maps, frequently updated land records and the institution of a permanent village reporting agency.

How is production measured? Estimates of *crop production* are obtained as a product of (i) **crop area** and (ii) **yield rate** for each crop being estimated independently.

Estimates of Crop Area

Crop and land use statistics are reported from 93% of the country's geographical area (the rest being made up mainly of hill tracts of North Eastern states and areas under illegal occupation by Pakistan and China with no statistics being available for this area). The reporting area is grouped into three categories:

- i) The first has 17 states and 4 union territories where cadastral surveys have been carried out and area and land use statistics form part of the land records maintained by the revenue agency. This accounts for 86% of the reporting area.
- ii) The second consists of seven states where no village level revenue agency exists and crop and land use statistics are collected by sample surveys. This accounts for 9% of the reporting area.
- iii) The third consists of 3 states and 3 union territories which also have no reporting system. This accounts for the remaining 5% of the reporting area.

The *Patwari*, who is the grass roots level functionary at the village level, does a complete enumeration of all fields (with a survey number given for each) in each village in category I area during each cropping season, collecting data on land use, irrigation and crop area. The village crop

statements (VCS) are then prepared and sent to the states and from there on to DESMOA. This process is limited to a 20% random sample of villages in category II area while in category III areas, it is based on the personal assessment of village *chowkidars*.

Estimates of Yield Rates

These are based on a system of crop cutting experiments and general crop estimation surveys (GCEs). For this, 'random samples' of (i) villages, (ii) fields growing the specified crop from each selected village and (iii) a random plot of size 5 x 5 meters from each sampled field are selected in successive stages. The crop cutting experiment in each selected plot gives the weight of produce and these weights form the basis of the estimates of the yield rates for different crops.

As GCEs and estimates of crop production take time, DESMOA makes advance estimates of crop area and crop production for principal food and non-food crops (food grains, sugarcane, fibres, etc.) that together account for 87% of the country's agricultural output.

Estimates of annual production of principal crops, gross area under different crops and yield per hectare of these crops are published in the annual publication 'agricultural statistics at a glance' (ASG) of DESMOA. This can also be accessed at the DESMOA website www.dacnet.nic.in

III Industrial Production

For purposes of data collection, manufacturing and repairing units in the country are grouped as (i) registered units and (ii) unregistered units. *Registered units* are units registered under an Act of parliament or state legislature (e.g. Factories Act, 1948). The rest are treated as *unregistered units*.

a) Registered Sector – the Annual Survey of Industries (ASI)

Data on production and other related aspects in registered manufacturing and repairing units are collected through the annual survey of industries (ASI) by the CSO. ASI are conducted under the provisions of the collection of statistics Act, 1953. All registered manufacturing and repairing units in the 'frame' are grouped into two basic categories - the census sector and the sample sector. The units in the former are surveyed on a complete enumeration basis while those in the latter are surveyed on a sample basis.

The ASI collects data on fixed assets, working capital and loans, employment, inputs, output, products and by-products manufactured, expenses and receipts, month-wise details of man-days worked, absenteeism and labour turnover for regular workers, etc. The reference period for the survey is the financial year immediately preceding the year of the survey. The collection of data from the units is based on records.

ii) Unregistered Sector

Data in respect of unregistered manufacturing units or enterprises are collected through periodic sample surveys (by CSO/NSSO) specifically designed to collect detailed data relating to employment, fixed assets, working capital, input, output, gross value added, etc. These are the follow-up enterprise surveys (FuS) conducted as a follow-up of the economic censuses (ECs) conducted by CSO. Data from a random sample of enterprises are collected from the premises of enterprises by interviewing respondents (as most of these units do not maintain any books of account) or from the owner of the enterprise (or any other respondent) at his/her household.

iii) Small Scale Industrial (SSI) Units

The SSI units are a part of the unregistered sector in the sense that these units do not come under the statutory coverage of any Act. However, the SSI units are registered on a voluntary basis with the directorates of industries of the state governments and union territory administrations. So far, three censuses of SSI units, one each in 1973-74, 1990-91 and 2002 with reference years 1972, 1987-88 and 2001-02 respectively, have been conducted. The reports of the censuses are separately published by the office of the Deputy Commissioner SSI (DCSSI). These censuses publish data for the SSIs more or less on the same set of variables as in the ASI reports. The periodicity of publication is, however, sporadic for the SSI censuses, unlike the annual feature for the ASI reports.

iv) Index of Industrial Production (IIP)

Estimates of the growth rates of industrial production based on the index of industrial production (IIP) are extensively used for policy-making at various levels in the government and also for decision-making in the banking and corporate sectors. The importance of IIP also arises as it is the only indicator generated *on a monthly basis* and disseminated on a wide scale. The indices are compiled and published at two levels: (i) for the all India level by CSO and (ii) for the state level by the SDESSs.

IV) Prices

Like in the case of index of industrial production, data on prices are also compiled and published as price indices. These are direct indicators of the purchasing power of money in various types of transactions involving goods and services. As such, they are also used as *deflators* for converting current value figures to a constant base. The price indices are important tools in the design and conduct of the monetary and fiscal policy of the government. These are also of great utility in taking economic decisions in the private sector.

Price data are regularly collected by central and state government

departments and agencies. For compilation and publication, three agencies - the labour bureau (LB) in the ministry of labour, the office of the economic adviser (OAE) in ministry of industry and the CSO in MOSPI are responsible. Two type of indices on prices viz. (a) the consumer price index (CPI) numbers and (b) the wholesale price index (WPI) numbers are regularly published. The former, the CPIs, are themselves of four types. These are:

i) Consumer Price Index Numbers (CPIs)

As price changes affect different sections of the population differently, four consumer price indices (CPI) are in use at the national level - CPI (IW) for industrial workers, CPI (AL) for agricultural labourers, CPI (RL) for rural labourers and CPI (UNME) for urban non-manual employees. The Labour Bureau (LB), Simla (H.P.), is responsible for the publication of first three and the CSO for the fourth.

a) CPI for Industrial Workers CPI (IW) (Base 2001)

The series of CPI (IW) covers industrial workers defined as manual workers irrespective of their income employed in factories, mines, plantation, railways, public motor transport undertakings, electricity generation and distribution establishments, ports and docks. It measures the temporal changes in the retail prices of a fixed basket of goods and services consumed by an average working class family and is thus an important indicator of the retail price situation in the country. It is mainly used for the determination of the dearness allowance (DA) paid to central/state government employees and workers in industrial sectors for revision of wages fixed under the Minimum Wages Act, 1948.

The *three important processes in the construction of the index* are the centre-specific weighting diagram, data on retail price and data on house rent. The weighting diagram consists of a basket of items which are determined by a working class family Income and Expenditure Survey conducted in selected centres across the country. Retail prices are collected on weekly, monthly and half yearly basis from selected markets and shops and house rent data through a six-monthly house rent survey. The all-India index is thus a weighted average of such centre-specific indices, the weights being the shares of individual centres in the estimated aggregate consumer expenditure. These are published in the Indian Labour Journal of the Labour Bureau and also posted on the Ministry of Labour website. These are also published in the Monthly Abstract of Statistics brought out by the CSO.

b) CPI for Agricultural Labourers and Rural Labourers, CPI (AL/RL)

A person is treated as an *agricultural labourer* if he or she follows one or more of the agricultural occupations in the capacity of a labourer on hire. Such a person may be paid in cash or kind or partly in cash and

partly in kind. A rural labourer is defined as one who does manual work in rural areas in agricultural or non-agricultural occupations in return for wages in cash or kind.

The source of weights for the CPI (AL) and CPI (RL) is based on the consumption expenditure data collected in the Consumer Expenditure Surveys by NSSO. Monthly price data collected from 600 villages spread over 20 states are used in the compilation of these indices. The sample of 600 villages is staggered over four weeks of a month with one-fourth of the sample covered every week. Prices are collected on a fixed price collection day. Like in the case of CPI (IW), the two indices of CPI (AL/RL) are also published in the Indian Labour Journal and the Monthly Abstract of Statistics besides being posted on their website.

c) CPI for Urban Non-Manual Employees, CPI (UNME)

An *urban non-manual employee* is defined as one who derives 50 percent or more of his or her income from gainful employment in non-manual work in the urban non-agricultural sector. The data for the construction of this index is drawn from the retail prices for selected items collected on a monthly basis from many centres across the country. The index is released for publication by the CSO with a time lag of about two weeks in the Monthly Abstract of Statistics of CSO. It is also published in the RBI-Bulletin published by the Reserve Bank of India.

ii) Wholesale Price Index

a) National WPI

The Wholesale Price Index (WPI) is a measure of the rise (or fall) in the prices of inputs and costs of production. The WPI series (with base year 1993-94) is compiled by the Office of Economic Adviser (OEA), Ministry of Industry, on a weekly basis, based on the price quotations collected for selected items and commodities. The basket of items is updated in order to keep it representative of the commodities included.

WPI are also published in the Monthly Abstract of Statistics, Bulletin of RBI and Handbook of Industrial Policy & Statistics published by the Ministry of Industry.

In addition to the four selected aspects (viz. population and vital statistics, crop area and production, industrial production and prices) discussed above, there are a variety of other aspects on which the Indian statistical system generates and publish data. While these are kept outside the purview of the present unit/section, data on employment in particular happens to be an important aspect for students of Economics to know about. The readers are referred to Unit 25 on Labour and Employment of this course for an account on this important aspect from the conceptual and measurement perspective. The publication of data on employment

is made by many organisations like the Census, NSSO, DGE&T (Directorate of Employment & Training, MoL, GoI), CSO, LB, etc.

b) State Level WPIs

Besides the national level WPIs, different states and union territories collect price data and compile CPIs/WPIs for different groups of commodities like agricultural commodities and manufactured items. These indices are published in State Statistical Abstracts.

Check Your Progress 1

1. Which is the organisation responsible for generating data on population in India? What is the system by which data on vital statistics collected in India?

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2. How are estimates of agricultural yields obtained in India?

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3. What do you understand by 'unregistered sector'? By which survey, data on 'unregistered manufacturing sector' is collected in India?

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4. Which price index is used for making adjustment in the wages of industrial workers? Which agency is responsible for the compilation of this index?

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8.3 NATIONAL STATISTICAL COMMISSION

The publication of data on the selected aspects of the economy discussed above show that data generation takes place in several ways, namely, through censuses, (random) sample surveys, by periodic statutory returns to specified authorities and as a by-product of administration. Notwithstanding these efforts which has contributed to the establishment of one of the best statistical systems in the world, there are not only many gaps in data collected but data requirement on many new and emerging areas are experienced by planners and others. In realisation of this, the government set up a *National Statistical Commission (NSC)* in January 2000 under the *Chairmanship of Dr. C. Rangarajan*. The commission was required to examine critically the deficiencies of the present statistical system in terms of timeliness, reliability and adequacy and recommend measures to remedy the situation.

The NSC, in its report submitted in 2001, observed that the Indian statistical system needed to improve its credibility and timeliness for which it suggested a five-fold approach as follows: (i) **reform** the administrative structure of the Indian statistical system, (ii) **improve** the system of collection of data, (iii) **explore** alternative techniques where necessary, (iv) **identify** new data needed and (v) **evolve** appropriate methodologies for generating new data on (iv) above. Some of the important specific recommendations of the commission are:

- (a) A *permanent and statutory apex body called the National Commission on Statistics (NCS)* [independent of the government in respect of policy-making, coordination and maintaining quality standards of Core Statistics] should be set up with the necessary legislation to accord the NCS a statutory status.
- (b) The permanent NCS should determine areas of official statistics considered *core, or critical, to the functioning of the economy*. The core statistics will have the following *characteristics*:
 - i) *cover sectors of national importance* like agriculture, industry, labour and employment and finance including socioeconomic sector and demography ;
 - ii) *mandatory* for governments at all levels to collect and disseminate;
 - iii) *conform* to prescribed definitions, concepts and standards laid down by the NCS;
 - iv) *updated* periodically with determined periodicity; and
 - v) *available* at both aggregate and disaggregate levels.
- (c) An administrative machinery within the government to be set up to implement and sustain the policies evolved by the proposed NCS. The existing Statistics Wing of MOSPI should be restructured into a full-

fledged department of the ministry to be known as *the National Statistical Organisation (NSO)*. The head of the NSO will be *the National Statistician*. The NSO will consist of three offices and one wing namely, *the Central Statistical Office, the National Sample Survey Office, the Data Storage and Dissemination Office and the Consultancy Wing*.

- (d) There is at present no *institutional mechanism* through which MOSPI can *effectively* coordinate with different central ministries/ departments in matters of statistics. To remedy this situation, the heads of statistical divisions in central ministries/departments should be designated as *Statistical Advisers* and assigned dual responsibilities – (a) assisting the ministry/department concerned in matters of statistics and (b) coordinating with the National Statistician in respect of the maintenance of quality standards as laid down by the NCS.
- (e) New statistical units should be set up in certain central ministries/ departments (e.g. Department of Women and Child Development, Ministry of Environment and Forests, and the Insurance Regulatory and Development Authority). Existing units in certain others [e.g. The CBHI, which is now a part of the Directorate General of Health Services (DGHS), should be upgraded as the Directorate of Health Statistics (DHS)] should be strengthened.
- (f) The SDES must be made responsible for technical coordination with all state government departments in respect of the content, methodology and dissemination of statistics.
- (g) The SDES, with their enhanced role, should hold wider technical discussion to help the state governments take a holistic view of the state's statistical system increasing its utility to the state governments.
- (h) The Indian statistical system lacks legal backing as the Collection of Statistics Act, 1953 is weak. A strong Act that is in accordance with the federal structure of the country should be enacted taking into account the informants' rights to privacy.
- (i) The role of Information Technology should be fully harnessed for processing, transmission and dissemination of data. Strong communication links should be established between the NSO and all other related statistical offices both at the centre and states through one or more Internet Service Providers or through a virtual private network.
- (j) A minimum list of variables and indicators on which data to be collected at the village level should be identified and a system for their compilation and aggregation established to facilitate local level development efforts. The variables and indicators required for aggregation at the district, state and national levels should also be identified with the community block as the first level of aggregation.

- (k) Steps should be taken to fill important gaps in the availability of statistical data, especially in newly emerging areas of governance. Two examples which may be cited are: (i) work on a regular basis for the identification and listing of new activities that emerge in the services sector; and (ii) development of a suitable methodology to estimate the contribution of emerging areas like software exports, e-commerce, entertainment sector, etc. in respect of variables like employment, gross value added, etc.

8.3.1 Action on the NSC's Recommendations

The central and state governments have taken steps to implement the recommendations of the NSC. To illustrate, the following two are mentioned in this regard.

1. **A National Commission on Statistics (NCS)** has been set up in 2006 with composition and functions suggested by the NSC. The commission has initiated examination of specific data areas for improvements in their quality and scope like price indices, definitions and concepts of employment, a minimum set of data needed for local level planning, etc. It has also taken up the question of empowering the state directorates of economics and statistics (SDES).
2. The ministries have also taken action on the recommendations of the commission. For instance, in respect of NSC's recommendation to improve the estimates in core sectors by improved methodology and at higher levels of disaggregation, estimates of agricultural crop area forecasts and final area estimates have been widened to arrive at crop yield rates at the gram panchayat level. Likewise, efforts have been directed at generating a new 'service price index' for many important service sectors like roads, railways, air transport, insurance, banking, trade services, business services, telecommunications and ports.

8.4 FUNCTIONS OF IMPORTANT STATISTICAL AGENCIES IN INDIA

The functions of the office of the Registrar General of India (RGI) responsible for conducting the decennial population censuses in the country was outlined in section 8.2.1 (I) above. We shall here know about the important functions of two other major statistical agencies in the country viz. the CSO and the NSSO.

Central Statistical Organisation (CSO)

Set up in 1951, broadly, the important functions performed by CSO are the following:

- i) coordination of the statistical activities in the country, laying down and maintaining norms and standards, providing liaison with central, state and international statistical agencies;

- ii) dissemination of information on the structure and activities of the official statistical system to the public, especially data users;
- iii) shouldering the responsibility for preparation of national accounts, promotion of regional accounts at state and district levels, generation of industrial statistics, conduct of economic censuses (ECs), follow-up surveys (FuSs) of ECs, family income and expenditure surveys, development of statistics on prices, human development, energy and the environment, dissemination of statistics on socio-economic aspects of life, etc.; and
- iv) organisation of annual ‘conference of central and state statistical organisations’ (COCSSO) to deliberate matters relating to the development of statistical data on aspects of socio-economic life of the country focussing in particular on the technical and developmental issues.

The most important publication of the CSO is the National Accounts Statistics (NAS). Also called as the white paper, it is an annual publication which presents the estimates of National Income for the country. The publication provides estimates of NI and capital formation at sectoral level; for the 1-digit and the 2-digit disaggregated NIC (National Industrial Classification) levels. The annual economic growth rates, for the economy as a whole and at sectoral level, are released by CSO based on their compilation for the NAS. [It may be mentioned in passing that there is a full BDP level economics course offered by IGNOU on National Income Statistics (EEC 10)]. Besides the NAS, the other important publications of CSO are the Statistical Abstract (an annual publication) and the Monthly Abstract of Statistics. Since 1980, CSO is also conducting the Economic Censuses, whose reports have become an important data source on the unregistered small enterprises in the country. You can get more information on the CSO divisions and functions by visiting the web site of MOSPI (Ministry of Statistics and Programme Implementation).

National Sample Survey Organisation (NSSO)

The NSSO was established in 1950 to conduct national surveys to assist the planning exercises on a scientifically designed sample basis in the country. The main functions of NSSO are:

- a) design and conduct of socio-economic surveys;
- b) undertaking research on survey techniques and methodology;
- c) organisation of field work for ASI and FuSs of EC;
- d) conducting the sample checks on area estimation and crop estimation surveys;
- e) developing urban sampling frames; and
- f) collection of price data and analysis.

The surveys of NSSO are conducted as rounds which refer to the period during which a survey is held (usually from July to June of 12 months duration). While there are a number of subjects on which NSSO has conducted surveys and published reports, the most important of the NSSO surveys is on Employment and Unemployment. Called employment-unemployment surveys (EUS) or labour force surveys, these surveys are held every 5-years, and are also therefore called as quinquennial surveys. Another important subject which is covered in a quinquennial manner is the subject of consumer expenditure which is held simultaneously with the EUSs. The latest EUS relates to the 65th round (see Units 3 and 25 for details). The results of the consumer expenditure are used to arrive at estimates of people below the poverty line. The publications of NSSO include a journal called Sarvekshana and many reports which are released as numbered reports. The NSSO also conducts quinquennial surveys focused on individual unorganised sectors (e.g. manufacturing, trade & services, hotels & restaurants, transportation, etc.). Called as unorganised sector surveys, these surveys are conducted as follow-up surveys based on the frame generated by the Economic Censuses conducted by the CSO and hence their reports are also known as the Follow-up Survey (FuS; same as follow-up enterprise surveys) reports.

8.5 INTERNATIONAL PERSPECTIVE OF STATISTICAL DATA

It is useful and instructive to judge the Indian situation in an international setting. Publications of the *United Nations* and its agencies as also agencies like the *International Monetary Fund (IMF)* and the *World Bank* provide data on different facets of the economies of their member countries. These international publications also provide information regarding comparability of country-wise data. The IMF has recently formulated a '*Special Data Dissemination Standards*' (SDDS) covering the Real Sector (i.e. national accounts, production index, price indices, etc.), Fiscal Sector, Financial Sector, External Sector, etc. for different countries to facilitate transparency in the compilation and dissemination of data on important aspects of the economy of individual countries to enable cross-country comparison of such data. Many countries including India provide to *IMF a National Summary Data Page* in respect of each of the areas and sub-areas listed in SDDS as per a *Dissemination Format* prescribed. In addition, individual country agencies disseminate an advance data release calendar, giving notice of the precise dates of release of data, three months ahead of the date of release. This notice is also posted on the website of the IMF's Data Dissemination Bulletin Board. Indian statistical agencies like CSO, RGI & CC, and RBI furnish the data required by SDDS and also disseminate an advance release calendar for such data. Such information, as provided by any country covered by SDDS, including India, can be accessed on the internet with the help of the Google search engine using the search parameter Special Data Dissemination Standards IMF.

1. What are the characteristics of ‘core statistics’ identified by the NSC (2001)?

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2. Which is the statistical agency vested with the responsibility of compiling the National Accounts in India? Mention the two important surveys for which this agency is also responsible?

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3. What is meant by ‘Special Data Dissemination Standards’ (SDDS)? How is cross-country comparison of data facilitated by SDDS?

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8.6 LET US SUM UP

The importance of ‘statistical data’ for policy planning and development cannot be overemphasised. The statistical system in India has evolved rapidly over the years, with institutional arrangements for standard setting and coordination being set up in the early 1950s. The system generates a large amount of data on a wide variety of aspects of the economy. However, the system has, over the years, developed weaknesses in terms of quality dimensions like reliability of data and timeliness, besides failing to provide data on newly emerging activities. To rectify the weaknesses, a National Statistical Commission (NSC) was set up in the year 2000. The NSC examined the entire statistical system and made a number of recommendations to reform the system. Many steps have since been taken to move in the directions suggested by NSC. The unit has provided an overview of the national statistical system obtaining in India focusing in particular on some selected aspects of the economy and major statistical agencies in the country.

8.7 KEY WORDS

- Cadastral** : Derived from the French word ‘cadastre’, the term cadastral refers to a registry of properties. A cadastral survey is thus a complete enumeration of all the survey numbers of the village.
- Frame** : A list of all population units. One of the basic needs for drawing a sample for a ‘sample survey’.
- Random Sample** : Refers to selection of samples in such a way that each unit has a pre-defined probability of selection. The CSO/NSSO surveys are all based on scientifically drawn random samples from which estimates of population characteristics (e.g. employment, number of persons below poverty level, etc.) are derived following well defined procedures [you can study more on this in the course EEC 14, an elective course on ‘statistics’ at the graduate (BDP) level].
- Deflators** : Are index numbers indicating change in price levels. Are useful in converting current value figures to constant value figures which are necessary for making temporal comparisons.

8.8 REFERENCES

Planning Commission, Government of India (2008): The Eleventh Five Year Plan (2007-12), New Delhi.

Ministry of Statistics & Programme Implementation, Government of India (2001): Report of the National Commission on Statistics.

8.9 ANSWERS/HINTS TO CYP EXERCISES

Check Your Progress 1

1. See Section 8.2.1 (I) and answer.
2. See Section 8.2.1 (II) and answer.
3. See Section 8.2.1 III (ii) & (iii) and answer.
4. See Section 8.2.1 (IV) (a) and answer.

Check Your Progress 2

1. See Section 8.3 and answer.
2. See Section 8.4 and answer.
3. See Section 8.5 and answer.

