



Department of Distance Education
Punjabi University, Patiala

Class : M.A. I (Economics) Semester : 4
Paper : II (Evolution and Structure of Indian Economy)
Medium : English Unit : I

Lesson No.

- 1.1 : Saving and Capital Formation in Indian Economy
- 1.2 Commercial Banking
- 1.3 Money and Capital Market
- 1.4 : Infrastructure in India (Power and Energy)
- 1.5 : Infrastructure in India (Transport and Communication)
- 1.6 Urbanisation in India
- 1.7 : Economic Development and Environment Degradation

Department website : www.pbidde.org

SAVINGS AND CAPITAL FORMATION IN INDIAN ECONOMY

Process of Capital

The process of economic development envisages substantial rise in the real national income and real income per head. Capital Formation is a necessary condition to initiate and accelerate the process of economic growth. In fact, the process of economic growth involves the process of capital accumulation and its formation seeks to divert a part of current production to build up the plants, equipments, tools and inventories of raw material to be used for further production. In fact creating the plants and other capital goods is an act of investment. The process of investment is materialised by means of real savings. Savings and investment are, therefore, the condition for capital formation to take place.

The problem of capital formation is essentially concerned with the problem which comes in the way of raising the rate of savings and investment. K.N. Raj has rightly pointed out that the less developed countries have typically a low rate of saving and one of their main problems is to raise it sharply within a short period to achieve higher rates of economic growth. India launched the process of planned economic growth on 1st April, 1951. Mahalanobis growth model provides the basis of India's planned economic growth programmes. This growth model put emphasis on saving and capital accumulation as the primary instrument of economic growth. This growth model was constructed on the assumption that much higher rates of saving could and should be realised. In fact increase in saving for a further increase in capital accumulation constitute the strategy behind economic growth. The process is to continue till savings, capital, accumulation and income reach the desired levels after which saving and capital accumulation ratio to income get stabilised and there would be steady and self-sustaining increases in national income.

The above discussion brings out the following components of the process of capital accumulation and capital formation.

Firstly, an increase in the volume of real domestic saving so that the resources that would have been used for consumption are released for investment.

Secondly, the creation of adequate banking and financial institutions to mobilise the saving of the community.

Thirdly, the use of the community's saving into channels of productive investment.

Analysis of Capital formation in India :

In order to accelerate the process of economic growth in India, the process of capital formation was speeded up with the beginning of the Second Plan. The process of capital accumulation was initiated on the assumption that major part of the resources for capital formation will be made available in the form of domestic savings and apart of it will be received as foreign capital from abroad. Capital accumulation is source and result of capital formation.

Trends in Saving

The place of capital formation and its financing through saving can be analysed on the basis of time series of saving and investment.

Estimates of physical capital formation are prepared by RBI and SCO from time to time. Table-I gives an idea of gross domestic saving which is one of the constituents of capital formation. During the past fifty years, there has been a constant rise in GDS as percentage of GDP. But this has not been sufficient to meet the requirements the economy. It was only 11.0 percent during 1960-61 when the economy had adopted heavy industry strategy in the second five year plan (1955-56 to 1960-61) capital required (formation) was to be of higher quantum, but savings were very less. This is the reason why dependence on foreign capital and investment has always been there.

Table-1
Gross Domestic Savings
(As per cent of GDP at current market prices)

Year	Gross Domestic Savings			
	Household Sector	Private Corporate Sector	Public Sector	Total (2 + 3 + 4)
1	2	3	4	5
1950-51	6.2	0.9	1.8	8.9
1955-56	9.6	1.2	1.7	12.6
1960-61	7.3	1.6	2.6	11.0
1965-66	9.4	1.5	3.1	14.0
1968-69	8.6	1.1	2.4	12.2
1973-74	12.2	1.7	2.9	16.8
1978-79	15.4	1.5	4.5	21.5
1979-80	13.8	2.0	4.3	20.1
1980-81	13.8	1.6	3.4	18.9
1984-85	14.3	1.6	2.8	18.8
1985-86	14.3	2.0	3.2	19.5

M.A. (ECONOMICS) PART-II		3		PAPER-II
1986-87	14.5	1.7	2.7	18.9
1987-88	16.7	1.7	2.2	20.6
1988-89	16.8	2.0	2.1	20.9
1989-90	17.9	2.2	1.7	22.0
1990-91	19.3	2.7	1.1	23.1
1991-92	17.0	3.1	2.0	22.0
1992-93	17.5	2.7	1.6	21.8
1993-94	18.4	3.5	0.6	22.5
1994-95	19.7	3.5	1.7	24.8
1995-96	18.2	4.9	2.0	25.1
1996-97	17.0	4.5	1.7	23.2
1997-98	17.6	4.2	1.3	23.1
1998-99	18.8	3.7	-1.0	21.5
1999-2000	20.8	4.4	-1.0	24.1
2000-01	21.4	3.7	-1.3	23.8
2001-02	23.2	3.3	-1.6	24.9
2002-03	22.3	3.9	-0.3	25.9
2003-04	23.2	4.6	-1.3	29.0
2004-05	23.6	6.6	2.3	32.4
2005-06	23.5	7.5	2.4	33.4
2006-07	23.2	7.9	3.6	34.6
2007-08	22.4	9.4	5.0	36.8
2008-09	23.6	7.4	1.0	32.0
2009-10	25.2	8.4	0.2	33.7
2010-11	23.1	8.0	2.6	37.7
2011-12	22.8	9.7	1.4	33.9
2012-13	20.2	10.0	1.7	31.8
2013-14	18.2	10.9	1.6	30.6
2014-15	20.5	11.7	0.9	33.1
2015-16	19.2	11.9	1.3	32.3

Note : Ratios of savings of individual sectors may not add to totals because of rounding off.

- Source* : 1. Government of India, Economic Survey 2004-2005 (Delhi, 2005), Table 1.5, pp. S-8 and S-9.
2. Economic Survey, 2014-15 Table 1.6 PPA-14, 16

Table-II
Gross Domestic Capital Formation (Investment)
(As per cent of GDP at current market prices)

Year	Gross Domestic Capital Formation				
	Public Sector	Private Sector	Total (2+3)	Errors and Omissions	Adjusted Total (4+5)
1	2	3	4	5	6
1950-51	2.8	7.7	10.5	-1.8	8.7
1955-56	4.8	7.7	12.5	0.4	13.0
1960-61	6.9	7.8	14.7	-0.3	14.4
1965-66	8.2	8.1	16.3	-0.2	16.2
1968-69	5.8	8.6	14.4	-1.2	13.2
1973-74	7.5	9.2	16.7	0.7	17.4
1978-79	9.2	11.5	20.7	0.9	21.6
1979-80	10.0	11.3	21.4	-0.8	20.6
1980-81	8.4	10.3	18.7	1.6	20.3
1984-85	10.4	11.2	21.6	-1.5	20.1
1985-86	10.8	12.9	23.7	-1.9	21.7
1986-87	11.2	12.0	23.2	-2.2	21.0
1987-88	9.5	12.6	22.1	0.4	22.5
1988-89	9.5	14.2	23.7	0.1	23.8
1989-90	9.5	14.1	23.7	0.9	24.5
1990-91	9.3	14.7	24.1	2.2	26.3
1991-92	8.8	13.1	21.9	0.6	22.6
1992-93	8.6	15.2	23.8	-0.2	23.6
1993-94	8.2	13.0	21.3	1.8	23.1
1994-95	8.7	14.7	23.4	2.6	26.0
1995-96	7.7	18.9	26.5	0.4	26.9
1996-97	7.0	14.7	21.8	2.7	24.5
1997-98	6.6	16.0	22.6	2.0	24.6
1998-99	6.6	14.8	21.4	1.2	22.6
1999-2000	6.9	16.7	23.7	1.7	25.3
2000-01	6.3	16.3	22.6	1.2	23.8
2001-02	6.2	16.0	22.2	0.4	22.6
2002-03 P	5.4	17.3	22.7	2.1	24.8
2003-04 Q	5.6	17.4	23.0	3.3	26.3

Year	Public Sector	Private Sector	Total (2+3)	Errors and Omissions	Adjusted Total (4+5)
2010-11	8.4	26.0	-	-	36.5
2011-12	7.6	28.4	-	-	38.2
2012-13	7.2	26.3	-	-	36.6
2013-14	8.0	23.3	-	-	32.3
2014-15	6.8	26.1	34.6	-0.2	34.4
2015-16	7.5	23.9	32.9	0.4	33.3

Note : Ratios of capital formation of individual sectors may not add up to totals because of rounding off.

P : Provisional estimates

Q : Quick estimates

Source : Government of India, Economic Survey, 2004-2005 (Delhi, 2005), Table 1.5, pp. S-8 and S-9 and Economic Survey 2014-15

A careful analysis of data on domestic capital formation clearly suggests that during the five decades of economic planning the rate of gross domestic capital formation (investment)¹ has risen considerably. The increase in the rate of investment has been neither steady nor firm.

The gross domestic saving has gone up from 8.9 percent in 1950-51 to 18.9 percent in 1980-81. The absolute as well as the relative growth in savings indicated that the positive correlation between net domestic product and savings has been obtained during this period and then to 23.5 in 2000-01.

Investment has also risen from Rs. 805 crores in 1950-51 to Rs. 13635 crores in 1976-77. The investment rate has also shown a rising trend from 8.7 percent in 1950-51 to 20.3 percent 1980-81 and then to 23.8 percent in 2000-01. Thus the positive correlation has also been observed between net domestic product and net investment (net domestic capital formation).

The analysis of the sectoral composition of savings brings out the following trends :

(1) It is significant to note that household sector has been the major source of saving in India. However, it is worthwhile to note that there has been marginal fluctuation in the rate of household saving as a percentage of total domestic savings.

(2) The contribution of the corporate sector in the formation of domestic savings is realised in the form of reserve funds raised by the companies. The reserve funds are the undistributed profits. The low contribution of corporate sector in the formation of saving is to be explained in terms of higher dividend pay out ratio to keep up the higher prices of equities in the stock exchange.

Moreover, the corporate sector finds it profitable to finance its assets on the borrowed funds by keeping higher debt-equity ratio. The development banks like ICICI, IFCI and IDBI are approached by the corporate sector to get loans at comparatively lower interest rates.

Table-3
Gross Domestic Capital Formation

Year	Gross Domestic Capital formation (Rs. Crores)	Gross Domestic Capital Formation
1950-51	866	8.7
1960-61	2470	14.4
1970-71	7043	15.4
1980-81	29230	20.3
1990-91	149536	26.3
2000-01	498179	23.8
2003-04	726868	26.3
2010-11	2841457	36.5
2011-12	3370087	38.2
2012-13	3659183	36.6
2013-14	3662490	32.3

Source : Ibid.

(3) The contribution of the Government Sector in the formation of domestic saving has also been insignificant when compared to the contribution of the household sector. This has largely been due to lower amount of realised from taxes as compared to the estimated amount. Surplus from public undertakings has been lower than the projected figures. That is why the government had to resort to deficit financing in increasing amount.

In short, the above discussion shows that the investment has largely been concentrating in industries.

Trend in Public Investment

The Indian economy has been functioning under the mixed economic system since 1948. Capital formation has taken place as a result of investment in both the private and the sectors. Table-4 reveals the percentage contribution of these sectors in the capital formation.

It is significant to note that the investment in the private sector has been showing downward trend from First Plan. It was only during the Fifth Plan that the trend was reversed especially after the VII Plan, when it crossed the public sector investment.

Table-4
Public and Private Investment (Percentage Distribution)

Planning	Public Sector	Private Sector
First Plan	46.4	53.6
Second Plan	54.6	46.4
Third Plan	60.6	39.4
Fourth Plan	60.3	39.7
Fifth Plan	55.0	45.0
Sixth Plan	56.0	44.0
Seventh Plan	48.0	52.0
Eighth Plan	45.2	54.8

Secondly, the investment in the public sector has been larger than the Private Sector throughout the planning period. During the Fifth Plan the decline in public investment compensated by the rise in the private investment. The rise in private investment during the Fifth Plan was due to concessions granted to large industries houses with a view to stepping up the receding industrial production.

(3) Government Policies and Problems

The capital accumulation process in India has been quite speedy. However, the capital accumulation at the rate of 30% to 35% of national income will have to be accomplished in order to achieve the goal of substantial growth rate. In this connection the major problems are related with mobilisation of savings. The savings in India are by and large contribution of the household sector. But the major portion of these savings are used up in this sector itself in accumulating physical assets. It is, therefore essential to offer attracting financial assets to the household to mobilise their savings. In this connection it is important to highlight the following policies of the Government.

- (1) The Government of the India has given fiscal concessions to the house hold sector. If they now keep their savings upto Rs. 6,000 annually in the form of Provident funds, LIC premium units of UTI and cumulating time of Post Offices, they get hundred percent exemption from income tax.
- (2) The largest budget has also made a provision of security bonds. These bonds have been designed to provide handsome return as well & security. The people upto the age of 45 are eligible to invest their savings in these bonds.
- (3) Investment in equities and bonds of companies also enjoy certain-concession in respect of income tax assessment.

- (4) Banking facilities are also being extended to rural areas to mobilise savings.

Note : For further details and upto date information you may consult Indian Economy; Rudder Datt and K.P.M. Sundharam. The latest revised edition

Indian Economy - S.K. Mishra and V.K. Puri, Latest edition.

COMMERCIAL BANKS**WHAT IS A BANK:**

Banking as an independent business originated during the 14th century in England. The business of banking in those days was conducted mainly by a class of people called "Jews" of Lombardy. These people viz. the Jews became popular in the course of time as 'Lombards' since they conducted their business in the Lombard street of England. The term bank is supposed to be derived from the Greek word 'Bancun' or 'Banherium', both of which mean 'table' or 'bench'. The money lenders, who transacted their business on the benches in the market place, displayed their coins across benches and when a banker was unable to meet his obligations, his Bancun was broken to pieces. According to J.W. Gilbert, the term bank is synonymous to the Italian word "monte", meaning a mound or heap. Banking is, accordingly, a business which requires a heap of money. The Concise Oxford Dictionary defines a commercial bank as "an establishment for custody of money which it pays out on customer's order." This definition, though short and simple, is not fully comprehensive as it emphasizes only one aspect of banking namely, the acceptance of money for safe custody and transfer under orders from the customer. It ignores many other important functions which modern banks perform. Since a modern bank performs a number of functions, different economists have defined the term differently.

Professor R..S. Sayers in his book "Modern Banking" opines that: Banks are institutions- whose debts - usually referred to as "bank deposits" - are commonly accepted in the final settlement of the peoples' "debts", According to Geoffrey Crowther a banker is to take the debts of other people, to offer his own in exchange, and thereby to "create" money. He may be a dealer in debts, but indebtedness is an obverse of wealth, and it would be equally permissible to describe the banker as a liquifier of wealth". Professor L. Hart in his book, "Law of Banking" defines the banker as "one who, in the ordinary course of business, honours cheques drawn upon the person from whom he receives money on current account." In his book "Money & Banking", Prof. Raymond P. Kent defines the bank" "as an organisation whose principal operations are concerned with accumulation of the temporarily idle money of the general public for the purpose of advancing it to others for expenditure."

Crowther observes "the present day banker has three ancestors - merchant, money-lender and goldsmith. A modern bank is something of each of these. It is said money has two properties. It is flat so that it can be piled up, and it is round, so that it can circulate.

The progeny of the money-lender is concerned with flat money, piled up money i.e. savings. The progeny of the goldsmith is concerned with round money, circulating money i.e. cash."

After all is said and done, just as it has been chosen to define 'money is what money does', so too perhaps the best definition of a bank, or banking company or a banker is by way of reference to the functions it or he performs.

In this context, it would be best to use the definition put forward by Banking Companies Act, 1949 (now termed as Banking Regulation Act, since 1965) which defines 'banking' and 'banking company' in Section 5(b) as:

Banking means the accepting, for the purpose of lending or investment of deposits of money from the public, repayable on demand or otherwise, and withdrawable by cheques, draft order or otherwise.

It is important to note some points in this definition. These are –

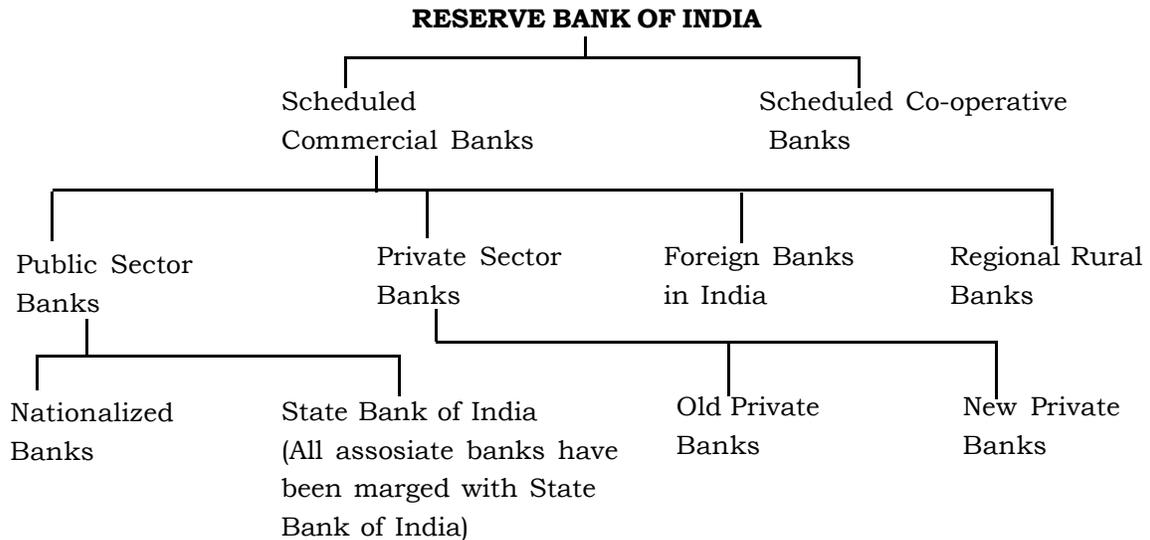
- (i) A bank will accept deposits of money, not goods or non-money financial assets.
- (ii) The acceptance of deposits by companies for the purpose of financing their own business is not regarded as banking.
- (iii) A foreign company incorporated outside India and having a place of business within India will be a banking company if it performs the functions of banking.
- (iv) The deposits are to be accepted from the public at large, not merely from shareholders.
- (v) The deposits are repayable/withdrawable.

Classification/Structure of Commercial Banks

Although banking system in India is organised as well as unorganized, we shall be focusing only on the organised system, i.e. we will not be including the indigenous banks and other private lenders in the structure of commercial banks here .

The organised banking system in India can be broadly divided into the Reserve Bank of India (which is the central bank of the country), the commercial banks, and the co-operative banks. Once again, we will leave out the co-operative banks, and concentrate only on commercial banks (as per the title of our lesson). The classification

or structure of commercial banks can best be understood with the help of a chart :



Source : Adapted from Gaurav Datt and Ashwani Mahajan : Datt and Sundharam Indian Economy 63rd Revised Edition (2016) p.890.

Under the RBI Act, 1934, banks are classified as scheduled banks and non-scheduled banks.

The scheduled banks are those which are entered in the second schedule of RBI Act, 1934. These banks had to fulfill the following conditions to be classified as scheduled banks –

- (i) The banker concerned must be in the business of banking in India.
- (ii) It must have paid up capital and reserves of value not less than Rs. 5 lakhs.
- (iii) It must satisfy the RBI that its affairs are not conducted in a manner detrimental to the interests of its depositors.

These banks come under the purview of various credit control measures of RBI. They have to maintain a minimum balance with the RBI. They are entitled to borrowing and rediscounting facilities of RBI.

The non-scheduled banks are not entitled to facilities from RBI except in abnormal conditions.

After 1969, commercial banks were broadly divided into nationalized/public sector banks and private sector banks. The State Bank of India and its seven associate banks, along with 19 other banks are public sector banks. The private sector banks include the

old as well as new banks (which came up mainly after 1991). Foreign banks in India are those banks which have their headquarters in other countries, but do banking business in India either by setting up branches, or through subsidiaries.

The main difference between State Bank of India (SBI) and nationalized banks is that while ownership of nationalized banks vests in the govt. of India, SBI is largely owned by RBI.

ECONOMIC FUNCTIONS OF COMMERCIAL BANKS

There are many kinds of banks: commercial banks, saving banks, industrial banks, agricultural banks, cooperative banks, exchange banks, central banks etc. But when we use the term bank without any prefix or qualification, it refers to commercial bank. The term commercial bank is a holdover from an earlier period when banks were predominantly short term financiers of lenders and merchants for goods in transit & inventories. Now when their lendings are no longer confined to short term "commercial" loans only, their name is not accurately descriptive of their nature and functions. It may rather be misleading. Today, these so-called commercial banks have diversified their activities to a point where these may be referred to as "Department Stores of Finance". They perform not just one but many types of functions, some of which are duplicated by other financial institutions.* The functions and services rendered by banks can be broadly classified under two heads:

- (a) Banking functions; and
- (b) Subsidiary Services

Under the former come such functions as the attraction of deposits, advancing of loans etc. Banks usually lend what is lent to them. Sometimes it so happens that they lend more than what is lent to them. Under such circumstances banks are said to "create credit." Creation of credit is another cardinal function which banks perform. They also undertake the transfer of funds from one account to another under written instances from their clients. So the modern banks are more concerned with the receipt, creation and transfer of deposits in addition to other miscellaneous services which they render to the industrial, trading and business communities.

Let us take each function and discuss it in some detail :

(a) Banking Functions :

1. Accepting of Deposits (or Bank as Borrower i.e. as collector and custodian of public savings): Banks attract deposits by mobilizing the savings of the community. The bank, to throw its net as wide as possible in order to have a rich game, has to maintain a variety of accounts that suits the needs and tastes of a large body of depositors. Generally speaking, deposits are of three types: fixed deposits, current

* We will study more about it in L. No. 11.

deposits & saving bank deposits. Fixed deposits are those deposits which are withdrawable only after a specific period. The bank allows a depositor to borrow funds against his fixed deposit as security. The longer the period of deposit, the more attractive the rate of interest. Fixed deposits are also known as time liability of the bank. Deposits accepted on current account, on the other hand, are withdrawable any time by the depositor by means of cheques. These are demand liabilities of the bank. As a rule the banks do not pay any interest on these deposits. Saving bank deposits are subject to certain restrictions on the amount so receivable or withdrawable. These deposits carry a lower rate of interest. A bank collects its funds mainly through its deposits. It pools the scattered savings of the community and thus, serves as the reservoir of the community's savings.

Thus, from the point of view of banking policy, deposits fall into two categories (i) Demand Deposits i.e. deposits repayable on demand. These include current deposits and saving deposits and (ii) Time Deposits: These have fixed maturity period and include fixed deposits, recurring deposits, deposits accepted under various schemes etc.

Banks owe the deposit amount to the depositing public. Deposits are bank's liabilities. To the extent these liabilities are demand liabilities, provision has to be made by banks to keep liquid assets with them to meet these liabilities on demand. Larger the proportion of demand liabilities, higher would be the ratio of liquid assets. Liquid assets, however, give a low return and hence bank's efforts would be to have maximum time deposits.

2. Grant of credit to all sectors of the economy (or banks as lender i.e. a dispenser of resources to the needy) : Money accumulated by the banks by accepting the deposits from the public is utilised for making advances to those who require it for productive purposes. The profit earning capacity of the bank mainly depends upon the performance of this function. This function is also important in the context of the economic development in general and the development of trade, industry and commerce in particular. Banks grant credit in the form of advances as Cash Credits, Overdrafts and Loans. While making advances, generally, no cash is given to the borrower. An account is opened in the name of the borrower and he is authorised to withdraw money through cheques until the amount of the loan agreed to by the bank, gets exhausted.

(i) Cash Credit : Cash credit is a type of advance wherein a banker permits its customer to borrow money upto a particular limit by bond of credit with one or more sureties. The advantage associated with this system is that a customer can withdraw money as and when required. The bank will charge interest only on the amount withdrawn by the customer. He is also free to repay into the account as frequently as he likes. Most industrial houses and business firms borrow money in this form. In the recent years, banks have started charging a minimum interest of around one percent for the amount

of account not used. However, the bank has no effective control on the end use of credit. This type of advance favours big and established borrowers.

(ii) Overdrafts : This facility is granted by the bank only to those persons who have their current accounts in the bank. To meet the temporary needs of the customers the bank may permit the customer to overdraw his current account. The interest is charged only on the actual amount used. The difference between cash credit and overdraft is that an overdraft is not granted regularly, whereas the cash credit is sanctioned regularly to the business houses to meet their working capital needs. Secondly, to get the overdraft facility, a customer should be an account-holder of the bank; while cash credit requires no previous account in the bank. Also, for overdrafts the security is financial assets, while for cash credit it is mainly physical assets.

(iii) Loans : Loans are lump-sum advances made by banks to the customers. Interest is charged on the entire amount sanctioned irrespective of whether the complete amount is withdrawn or not by the customer. Loans are of various types. These may be term loans, participation loans, personal loans, call loans or collateral loans. Term loans are granted for a fixed period exceeding one year. They are granted to meet capital requirements of the business houses. These loans are to be repaid strictly according to the schedule of repayment. Utmost care is exercised while granting these loans. When loans are sanctioned by more than one financing agency to share the risk; we call them as the participation loans. These loans are more popular in the U.S.A. Such loans are granted only when the risk involved in lending is too large.

Personal loans are granted to the individuals to meet their personal requirements, mostly concerning their standard of living. The loans are repayable in monthly instalments. Personal loans are normally sanctioned for a period not exceeding two years. These loans are popular in the U.S.A. and U.K. Call loans are usually granted to the dealers on the stock-exchange. These loans are granted only for a few days - normally one to fifteen days. The banks reserve the right to call back the payment of these loans any time. When loans are granted against certain collateral securities, such as promissory notes supported by bank, securities of pledging etc., they are called collateral loans.

Thus, a bank acts as an intermediary in mobilising savings of the people and diverting them to the producers and businessmen to drive the wheels of industry and float the vessels of commerce.

3. Discounting of Bills : Discounting of bills is, practically speaking, lending for short periods. A trader, for instance, who does not want to lock up large funds in trade credits, may draw a bill of exchange on his debtor and after it has been accepted by, or on behalf of the debtor, he may get it discounted by his bankers. This gives the trader immediate possession of money to him less (i) a deduction for the loss of interest and (ii) cost of collection by the bank. The bills are usually for three months and when they

mature, the bank realises the face value of the bills from the debtor. This type of business is very common in advanced countries. In India efforts are being made to develop a regular bill market.

4. Creation of money i.e. bank as a creator of credit : The most distinctive deposits i.e. demand deposits serve as money in the community. Demand deposits are created in two ways. Firstly, by converting cash into a demand deposit with the bank and secondly, by borrowing from the bank and lodging the same amount with the bank as demand deposit. The latter form of deposit is most popular and provides the main channel through which banks create credit. The commercial banks create and destroy the community's money supply in the form of demand deposits through variations in their earning assets or their debt-instruments. The banks advance a loan to its customer and allows him to operate his loan in return for promise to repay the same together with interest thereon at some future date. A loan of Rs. 1000 sanctioned to a customer has the effect of not only increasing the total deposits of the bank, but has enabled the banker to put thousand more rupees into circulation. Every loan sanctioned by the banker creates a deposit. Thus, the bankers lend not only what is lent to them but sometimes more than what is lent to them. The mechanism of credit creation is explained in detail towards the end of this lesson. It is sufficient to say at this stage that banks are generally responsible for most of the fluctuations in the money supply in the country.

5. Clearing Cheques: The depositor has the right to withdraw his deposits with or without notice, depending on the nature of the deposits. He has also the right to ask his banker to transfer the funds into the account of someone else by means of a cheque. These cheques are frequently deposited in a bank other than the one on which they are drawn. This requires the transfer of credit, not only from one depositor to another but also from one bank to another. This process, called clearing, has become highly complicated but exceedingly efficient part of banking operations. Let us see how the process is carried on.

Whenever the payees or the receivers of bank cheques deposit in the same bank on which the cheques are drawn, it is just a case of book adjustment in the same bank. But normally, cheques are deposited in other banks. Consequently, the bank receiving the cheque deposit must collect the proceeds from the drawee bank. When it happens in the same city, the cheques are collected through local clearing house. But when they are drawn on other cities, agents located in those cities must be used to affect the collection. In such cases, the local bank carries a deposit with a city bank that agrees to act as its collecting agent. At the time of clearing, the messengers from each bank go to the clearing house and exchange the package of cheques so that each messenger comes into the possession of the cheques drawn on his bank. On a specially prepared statement sheet containing the names of all other clearing banks the total of cheques is brought to record

from the clearing house. If the amount received exceeds the amount brought to the clearing house, the bank has an unfavourable balance, or is a net debtor and must pay the difference to the clearing house. In some cities, cheque clearing is formally carried out more than once a day. Innovations like computers has made the task of cheque clearing considerably easier and time saving.

6. Financing foreign trade and as a dealer in foreign exchange : Modern banks finance foreign trade. They issue and accept instruments of credit like bills etc. for discounting purposes. They often accommodate businessmen and traders for purchasing and selling of goods.

Modern commercial banks, many of whom have branches or offices or correspondent banks in other countries trade in foreign currencies also. Although the central banks may intervene in times of difficulties, banks engage in currency exchange as a normal function without intermediary. This function has increased the security of commercial bank, as the foreign exchange reserves in other overseas office swelled, and gave rise to increase in their liquidity. Banks finance multi-national corporations and other industrial houses as well as exchange house, conserve foreign currency and accept foreign remittances for conversion into local currencies. Since the central banks are the custodian of foreign exchange and are also banker's bank, "reserve" information is sent by commercial banks to the central banks periodically.

7. Financing Industries : Banks provide the necessary finance for industrial development. This function is also of great importance to a country which is planning the use of its resources. The attitude of commercial banks towards industrial finance varies from country to country. England followed a natural policy towards industrial finance, while in Germany there was a complete collaboration between banks and industrial finance. In certain other countries, industries continue to develop on account of the finance provided by the banking system.

(b) Subsidiary Functions:

The subsidiary functions of modern commercial banks can be classified under two heads :

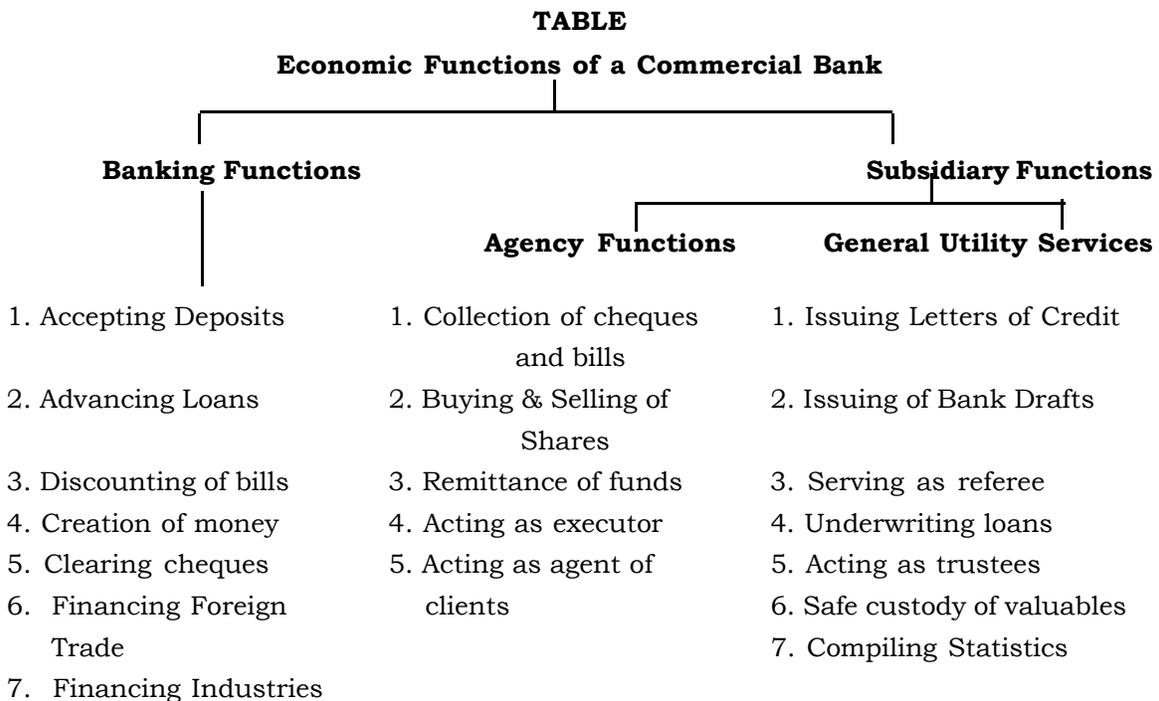
- (i) Agency Functions and
- (ii) General Utility Services

(ii) Agency Functions : A commercial bank performs certain functions as acting as an agent for and on behalf of its customers. Some of these functions relate to (a) collection and payment of cheques, bills, promissory notes and other commercial instruments, interest, dividend, subscriptions, rents or other periodical receipts and payments like insurance premium, (b) buying and selling of shares, bonds, securities etc. on behalf of the customer, (c) remitting of funds on behalf of the customers by drafts of mail or telegraphic transfer; (d) action as executor trustee and attorney for its customers,

and (e) acting as correspondent agent, representative of its client etc.

(ii) General Utility Services : A commercial bank performs certain general utility services such as (a) issuing of letters of credit to customers (b) issuing of bank drafts and traveller's cheques, transfer of funds from one place to another, (c) serving as referee to the financial standing and credit worthiness of the customers ; (d) underwriting loans to be raised by public bodies and corporations; (e) provide safety vaults or lockers for the safe custody of valuables; (f) acting as trustees and executing the wills of the deceased, and (g) compiling statistics and information relating to trade, commerce and industry.

Thus commercial banks render valuable services to the community. A country with a well-developed banking system has a secure foundation of industrial and economic progress. It constitutes the very life blood of an advanced economic society. The following chart facilitates in understanding the functions of commercial banks.



IMPORTANCE OF BANKS :

Banks are essential institutions for mobilizing savings for the purpose of lending. The banks, while lending, choose their debtors properly. As one authority has put it : "They discover the industrious, the prudent, the punctual, the honest, while they discount the spendthrift, the gambler, the liar and knave. There is, many a men who would be

deterred from dishonesty by the frown of a banker though he might but care to the admonition of a bishop." In short, banks are public conservators of commercial virtues. A well knit banking system, therefore, secures- a good foundation for nation's industrial and economic progress in the following ways :

1. In the first place; a banking system **accelerates the rate of capital formation** in the country. The basic malady that effects a developing economy is the tardy rate of capital formation. The essence of capital formation, according to Nurkse, is the diversion of a part of society in currently available resources for the purpose of increasing the stock of capital goods so as to make possible an expansion of consumable output in the future. Now the mere existence of a sound banking organization tends to encourage savings, thrift, economy and investment, facilitates the interchange of goods and creates a general feeling of security and prosperity which, besides accelerating the formation of capital, also pushes up the national dividend.
2. Secondly, it acts as an **engine of balanced regional development** in the country.. The banks help in the proper allocation of funds and they aid in the transfer of the surplus of one district to another where it can be more gainfully and efficiently employed. In this way production is stimulated by the more rapid circulation of money and by the facility of obtaining the necessary capital to ride over difficult times. Bank loans as the manufacturers enable them to increase productive capacity and to adopt new method & machinery.
3. Thirdly, the banking system helps in the **extension of size of market**. The commercial banks act as intermediary between the seller and buyer. Goods are supplied on bank guarantees which makes it viable for commerce and industry to cultivate and locate markets even in those areas which may be physically too distant otherwise to prove an economic proposition.
4. Fourthly, bankers render great service in **controlling credit** & co- operating with the central bank.
5. Fifthly, the banks help in **developing entrepreneurship**. This role is being effectively played by underwriting new scrips by granting assistance for promoting new ventures of financial promotion under the joint guarantee system. In Germany, for example, scarcely a single important company has been founded without the collaboration of a bank.
6. Lastly, banks provide a **convenient and safe deposit** for valuables and securities in transacting foreign exchange business and in placing their established reputation at the service of merchants and travellers by issue of various forms of letters of credit.

Hence there is no need, whatever, to overemphasize the importance of banking as part and parcel of modern industrial and commercial culture. The role of banks in promoting development & growth specially in the context of planning and breaking the trap of underdevelopment is an issue of topical interest to the students of any economy. To sum up "commercial banks have been rightly crowned as," nucleus of all economic activities."

ROLE OF COMMERCIAL BANKS IN ECONOMIC DEVELOPMENT :

Besides performing the usual in commercial banking functions, banks in developing countries play an effective role in their economic development. The majority of people in such countries are poor, unemployed and engaged in traditional agriculture. There is also an acute shortage of capital. Commercial banks help in overcoming these activities.

In India, the key feature of the post-nationalisation period in the field of allocation of credit has been growing functional diversification with increasing emphasis on credit to priority sectors. The concept of priority sector for the allocation of commercial bank credit took definite shape during the brief period of the Social Control of Banks (1968). Initially, three sectors - agriculture, small industries and exports were officially recognised as priority sectors. Later, a few more categories came to be added to the list, namely, road and water transport operators, professional and self-employed persons, retail trade and small business and education. The banks were directed to provide 40 percent of total credit to priority sector, of which at least 15 percent of total credit was to be by way of direct finance to agriculture and at least 25 percent of priority sector advances (or 10% of total credit) was to go to the 'weaker sections.'

Banks provide term loans to identified poor families under the IRDP (Integrated Rural Development Programme) scheme, which was launched in 1978-79 as a major poverty alleviation programme. Its main objective has been to take above the poverty line the families in the identified target groups by creating substantial employment opportunities in rural areas and by enabling them to acquire productive assets with the help of govt. subsidy and term loans from banks. The target groups are scheduled castes/tribes, agricultural labourers, rural artisans, marginal and small farmers, etc.

Commercial banks have also been lending extensively to the farmers both directly and indirectly. The latest thrust was the introduction of service area approach in 1989. Under this, all the villages have been allocated to different branches of banks in such a way that each branch has a cluster of 15 to 25 villages. The branches have to survey the villages allocated to them and prepare financial plans for each of them. However, on the demand of the Panel of Bankers of the Indian Bankers' Association (in 1998), the SAA was given up.

Another notable feature has been the shift of banking from the big customers to

small ones. In the field of bank advance too, small scale industries have come to occupy a prominent place.

Thus, commercial banks have come in a big way to help agriculture and other hitherto neglected priority sectors and making the task of economic development easier.

CREATION (AND DESTRUCTION) OF CREDIT

All banks are engaged in the creation of credit. Creation of credit is one of the most important functions of a modern bank. Commercial banks are defined as "purveyors of money" (Sayers). A bank has sometimes been called a factory for the manufacture of credit, or what Harry G. Johnson calls as "producers of money". Money can be created or destroyed in the sense that its supply is increased or decreased by the Government or by the commercial banks. In this section, we are mainly concerned to show the process and mechanism involved in the creation & destruction of money in the above sense.

Creation of Bank Credit: Demand deposits are by far the most important constituents of total money supply in modern times. Demand deposits arise principally from (a) cash deposits (h) bank loans and investments. The former are called "**Primary Deposits**" and the latter "**Derivative Deposits**". In the case of primary deposits there is no net increase in the money supply, since there is merely a shift from cash to demand deposits. Primary deposits, however, are capable of serving as basis for credit expansion and, therefore, for increased money supply. It is derivative deposits which result in a new increase in money supply, since bank credit is thereby created, to use Crowther's terminology, out of thin air. Thus, banks create credit in two ways: (i) by advancing loans, (ii) by purchasing securities. The process involved in creation of bank credit can be illustrated as follows :

The Single Bank : When a bank lends, the borrowers do not ordinarily take the proceeds in cash; instead he takes on an account in the bank. On the bank's balance sheet, loans (as asset) and demand deposits (as liability) both arise. A bank creates a demand deposit when it lends. In effect, since demand deposits are money; bank creates money.

To begin with, since the only limit on creation of demand deposits appears to be the requirement of legal reserves (say 10%), a superficial answer to the problem of how much a bank can lend, would be that it can lend (i.e. create demand deposits) upto a limit of 10 times (in our example 10% of reserves) its excess reserves. But this will happen only if there are no cash transactions. The reality is that borrowers don't take out loans, and pay interest on them, just to leave the funds sitting there. They want to spend the money. They will probably write cheques on their new demand deposits, which will probably

be deposited in other banks by their recipients.

Thus, a single commercial bank can lend up to the amount of its excess reserves, and no more.* But it can lend or buy securities upto the amount of its excess reserves without endangering its legal reserve position.

An individual bank can therefore create money, but only if it has excess reserves to begin with. As soon as it has created this money, it loses it to another bank when the money is spent. This is the key difference between the ability of a single bank to create money as compared with the banking system as a whole.

Banking System as a whole : The commercial banking system as a whole can expand credit many times the initial excess reserves. The process is called multiple credit expansion.

To understand the basic economic process underlying creation of deposits, we make certain simplifying assumptions. We suppose that there are many banks, and each is required by law to hold 10 percent cash reserves against its transactions deposits. We also assume that the public does not change its currency holding throughout the process. Thus, there is no currency drain. It is also assumed that each bank will put all the money that is possible into earning assets (loans) so that there are no excess reserves.

Suppose that there is an initial deposit of Rs. 1000 in a bank, (name it as Bank I). This increases both the demand deposits and cash reserves of bank I. By our assumptions, the bank will hold 10% (i.e. Rs. 100) of this deposit in its cash reserves, and put the rest 90% (i.e. Rs. 900) into loans. By our second assumption, the person who takes this loan will not keep the amount with himself, but deposit it with some other bank, say bank II. Now bank II has cash reserves of Rs. 900. By our assumptions, bank II will keep 10% (i.e. Rs. 90) of this deposit with itself, and loan out the rest of 90% (Rs. 810).

Once again, the person who took this loan of Rs. 810, will deposit it in a third bank III, which will keep 10% of it (Rs. 81) in reserves, and loan out the rest 90%.

We see that total transactions deposits in these three institutions increased to Rs. 2710, whereas we had started with a Rs. 1000 deposit. Transactions deposits have thus been created by the banks; and since transactions deposits are money, it is equally accurate to say that the banks have created money.

Now the question is, where does this process stop? One way is to keep going through the arithmetic of successive rounds. But since this is a cumbersome process, we can find the solution by 'setting up' the problem in mathematical terms, as follows :

Now, Rs 1000 = 1000

$$\text{and } 900 = \frac{9}{10} \times 1000 \text{ (because } 900 = 90\% \text{ of } 1000 = \frac{9}{10} \times 1000)$$

*A single bank here does NOT amount to a monopoly bank in the economy. If there is a monopoly bank in the economy, then the amount of demand deposits created will be the same as that created when the banking system as a whole is considered, provided we consider the same set of assumptions.

$$\text{And } 810 = \frac{9}{10} \times 900 = \frac{9}{10} \times \frac{9}{10} \times 1000 = \left(\frac{9}{10}\right)^2 1000$$

and so on

Now let ΔB = amount by which primary deposits increased, (i.e. Rs. 1000 in our example)

R_d = reserve requirement (10% or $\frac{1}{10}$ in our example)

\therefore Let $r = 1 - R_d$ ($90\% = \frac{9}{10}$ in our example)

Thus, the preceding sequence of numbers can be stated symbolically as $\Delta B + \Delta Br + \Delta Br^2 + \dots$

Let us suppose the process ends in n rounds, so that

$$S = \Delta B + \Delta Br + \Delta Br^2 + \dots + \Delta Br^{n-1} = \Delta B (1 + r + r^2 + \dots + r^{n-1})$$

Where S stands for sum.

Since the above is a geometric progression

$$S = \Delta B \frac{1 - r^n}{1 - r}$$

If n is very large i.e. $n \rightarrow \infty$, then $r^n \rightarrow 0$.

$$\therefore S = \Delta B \frac{1}{1 - r}$$

But $1 - r = R_d$ (because $r = 1 - R_d$)

$$\text{Hence } S = \Delta B \frac{1}{R_d}$$

This gives us the total deposits created by the banking system.

In our example,

$$\Delta B = \text{Rs. } 1000$$

$$R_d = 10\% = \frac{1}{10}$$

$$\therefore S = 1000 \times \frac{1}{\frac{1}{10}} = 10,000$$

i.e. Deposits worth Rs. 10,000 were created (in our example) out of an initial deposit of Rs. 1000.

Thus, the total money/credit created by all banks together is the reciprocal of reserve ratio (R_d) multiplied by initial deposit inflow (ΔB).

The Destruction of Bank Credit by Banking System : Bank credit can be destroyed through a reduction in bank loans and investments; the extent of destruction depending on the prevailing reserve ratio. A reduction of each legally required reserve to support demand deposits leads to multiple contraction of bank credit throughout the banking system and therefore, to a decline in the total supply of money.

Suppose that a depositor permanently withdraws Rs. 100 from his checking account that is not spent but the money is kept in hoarding. The bank in question loses Rs. 100 of cash and Rs. 100 of demand deposits. Suppose that the reserve ratio is 10 percent. The bank presumably had Rs. 10 against the 100 rupees of demand deposit withdrawn, but has to pay Rs. 100 (and not Rs. 10). The bank has to use Rs. 90 of its legal reserves held against other demand deposits in order to meet the original depositor's demand for Rs. 100. This means that the bank's legal reserves have fallen below the required minimum and the bank will have to take some action to improve its cash-reserve position. This is where a 10 : 1 contraction of banking system begins. For the bank must call in loans for selling securities to the amount of Rs. 90 thus involving other banks in the process of the 10 : 1 contraction of credit. If, however, the bank could acquire additional cash by borrowing from the central bank, it would not take deflationary action. Thus, a reduction of cash reserves below the legal minimum leads to magnified decline in total demand deposits and, therefore, to a sharp decline in total supply of money. The table below indicates the effect.

TABLE

Multiple Credit Contraction		
Reserve deposits	Initial of cash	Magnified Contraction in total
10%	10 : 1	1000
25%	4 : 1	400
50%	2 : 1	200
100%	1 : 1	100

It is not difficult to understand why some economists favour a 100 per cent reserve ratio. A system of 100 percent reserve, it is believed would stabilize the price system since it would prevent an otherwise inevitable multiple credit contraction or expansion of bank money. But it is still a moot point.

Practical Limits to deposit expansion :

1. Cash Drain : The extent of credit creation depends on the amount of cash which commercial banks hold. The larger the amount of cash with the banking system, the greater will be the excess reserves and larger will be the credit creation power of the

banks. It has been assumed that in the chain process of multiple credit creation all the reserves lost by a bank are gained by another bank and no payments are made in cash. In practice this may not be the case, for some reserves may be drained away from the banking system. It is quite apparent from this that presence of and cash drain amounts to an increase in the reserve requirement, and thus, reduces the expansion potential of any given volume of excess reserves.

2. Excess Reserves : We have assumed that banks keep only as much reserves as they are legally required to do. In actual practice, banks usually maintain some "excess" reserve in addition to the statutory requirement. All banks need some cash to meet reserve requirement with the central bank. Higher the reserve ratio to be maintained, smaller will be the relative excess funds- and smaller will be the volume of credit creation and vice versa.

3. General Policy of Banks : Any single bank cannot follow an expansionist or a contractionist policy for a long time; others also want to do so. They must march like a regiment in a parade. For example, if one bank expands credit enormously, only a fraction of the additional bank deposits thereby created will remain with it. As a result this bank will have permanent debit balances at the clearing house and its reserves with the central bank will dwindle. In other words, cash reserves will come down and it will find itself in a precarious situation.

4. Different Types of Deposits: We assumed that all the deposits are in the form of demand deposits only, while actually a large part of total deposits is in the form of time deposits. Since time deposits are not withdrawable by cheques and do not serve as money, the result of an increase in time deposits is to reduce the money supply. A shift from demand to time deposits limits the potential expansion of demand deposits.

5. Control by the Central Bank : The central bank has the duty of maintaining the value of money and is empowered to control commercial banks, for commercial banks also create money. Hence the restrictions imposed by the central bank (both quantitative and qualitative controls) would also affect the capacity of a bank to create credit.

6. Availability of Securities : Bank cannot create money out of their own. If we examine the balance sheets, we will find that against each deposit created by them they hold assets in various forms as shown in the asset column of the balance sheet. Availability of such assets like government securities, collateral securities, bills etc. is another important limitation. Total securities which can be offered at a point of time are restricted to a fixed amount.

7. Demand for Loans: In order to make loans, the banks must find customers who wish to borrow. If there is no or low demand for loans by businessmen and traders, banks will obviously not be able to create much of additional deposits. Thus, the amount

of borrowing by the customers sets a limit to the amount of expansion of credit. This is specially so in times of depression.

8. Cash & Banking Habits : The total cash in the banking industry would depend upon the total cash deposited by the people, which in turn depends on their banking habits. If for any reason, the people decided to hold more cash, the flow of cash into the banking industry and consequently its power to create credit will decline. How much cash the people will hold and how much of it they will deposit in banks depends upon the total cash supplied by the government and the central bank, as well as the banking habits of people.

Thus, we find that there is nothing mechanical and completely accurate about using a 5: 1 or any other fixed ratio for multiple expansion. The process of multiple credit creation described above should, therefore, be taken to indicate that an individual bank would be able to expand its lending safely by an amount equal to its excess resources. If each bank adopts the safe rule of thumb of expanding by the amount of its excess reserves, a part of the additional reserves will pass over the other banks until, in the end, the increased reserves are spread over the system as a whole supporting large volumes of loans and deposits.

SIGNIFICANCE OF CREDIT CREATION

Credit creation vitally affects the level of economic activity in the country. Left to itself, the credit expansion or contraction may "boom the booms" and "depress the depression". Thus, credit control has a lot to do with the cyclical fluctuation in the economy. In the case of underdeveloped countries, credit creation has to be controlled to ensure economic growth stability. It can be easily understood that if the credit is allowed to be unduly created, prices rise and wages will rise alongwith. Inflationary situation is inimical to economic growth because entrepreneurs are deprived of necessary funds. Hence the monetary authorities pursue a policy of controlled expansion of credit to ensure economic growth with stability. Since money supply in a country depends on the volume of credit created, credit expansion plays a very vital role in determining the level of national income and the volume of employment in the country.

Check on Credit Creation : In any country, central bank is vested with the sole responsibility of controlling the credit in the economy. The various objects for which a Central Bank controls the credit are (i) to safeguard its gold against internal and external drains (ii) to ensure stability to internal prices ; (iii) to achieve stability of foreign exchange; (iv) to eliminate fluctuations in output and employment; and (v) to assist in economic growth. The assistance is required not only in underdeveloped countries desirous of accelerating economic development but also in developed countries desirous of maintaining and improving their living standards.

The central bank can control credit by the following methods

- (a) **Quantitative or General Controls which include :** (i) Manipulation of bank rate or discount rate; (ii) Open Market operations; (iii) Varying cash reserve requirements etc.
- (b) **Other Methods of Credit Control include** (i) varying margin requirement; (ii) Secondary reserve requirement (iii) Rationing of credit; (iv) Direct action; (v) Moral suasion and (vi) Publicity.

All or a combination of these methods is employed by the central bank to tide over credit expansion with a view of bringing; an equanimity in the economic situation. These methods will be dealt with in detail in a subsequent lesson.

SUMMARY

A bank is an institution which deals in money. Modern banks perform several functions like accepting deposits, advancing loans, discounting bills, creation of money, clearing cheques, financing foreign trade, financing industries and agency and general utility functions. However, creation of credit is one of the cardinal functions.

Commercial banks, defined as 'purveyors' of money, play an important role in the creation of credit money. A particular bank can create credit only to the extent of excess reserves while the banking system as a whole can create multiple credit. The total credit creation of the banking system as a whole is equal to initial deposits multiplied by the inverse of cash reserve ratio.

Though, in theory, the banking system as a whole can create multiple credit given by the above formula, in practice, there are certain restrictions like the cash drain, amount of excess reserves, general policy of the banks, different types of deposits, availability of securities, demand for loans, banking habits of the people and the control by the central bank. In order to ensure economic growth, the stability under expansion of credit must be checked. The responsibility of controlling the credit in the country is vested with the central bank. The central bank employs both quantitative and qualitative methods to achieve the desired results.

Note: Suggested Readings and Questions are given at the end of the unit.

COMMERCIAL BANKS - II
(Theories of Commercial Banking)

INTRODUCTION

In the previous lesson, we had an introduction with commercial banks. We studied about the evolution and functions of commercial banks, its most important function being the creation of credit. This creation of credit function is the one that separates commercial banks from other financial institutions.

The functions of commercial banks made clear two things - one, that banks lend other people's money, and two, most of the liabilities of banks are payable on demand (i.e. to say, the 'other' people may, and do, ask for their money back at any time!). These two aspects of banking lead to what is generally called the central problem of bank management i.e. reconciling the conflicting banking goals of solvency, liquidity and profitability. Let us see what these terms mean.

1. LIQUIDITY :

Liquidity is the ability of a commercial bank to meet claims of cash on demand. R.S. Sayers defined it as, "Liquidity is the word that the banker uses to describe the ability to satisfy demands for cash in exchange for deposits." People deposit their money with the bank for safe custody and convenience and they can demand money back at any time. For this, a bank must keep sufficient amount in the form of liquid cash or nearly so. Assets for this purpose are known as liquid assets and they are cash in hand, money at call and short notice, bills of exchange and treasury bills etc. In the words of Chandler, "By the liquidity of an asset we mean its capacity to convert into money easily and quickly and without loss of value in terms of money." Obviously, money is the most liquid asset.

If a bank does not keep liquidity or is not able to meet the demand for cash by the depositors, it loses confidence of the public. Again, a bank cannot afford to keep all his money in liquid form.

Requirement of liquidity in portfolio management is conditioned by various factors such as :

(a) Liquid Reserves :

Commercial banks have to keep certain amount as liquid reserve because of the bindings of the banking law or by convention.

(b) Banking Habits of the People

If people have developed banking habits, i.e., they use cheques then the use of cash shall be less and there will be less need for liquid assets.

(c) Structure of Banking System:

In case of branch banking the cash reserves can be centralised in the head office and branches can be managed with less cash reserves.

(d) Nature of Economy:

In a developed economy, most of the transactions are through cheques.

But in an underdeveloped economy, most of the transactions are through cash, therefore, banks require more liquid assets.

(e) Money Market:

If there is a developed money market then it is quite easy to buy or sell securities. This will mean less liquid cash and vice-versa.

2. SOLVENCY:

Commercial banks have to create maximum confidence in the public. Such a confidence can be created only by meeting their demand for withdrawals at any time. Therefore, a sound bank must be ready to meet all the liabilities with the assets. According to Prof. Sayers, "A bank is solvent if the amount of its assets exceeds the amount of its liabilities to all claimants."

The problem of solvency arises because of the fixed nature of liabilities and the assets are liable to change in terms of value because of changes in rates of interest.

3. PROFITABILITY:

Commercial banks have to earn income to meet the cost of running the bank, payment of interest on deposits, accumulation of reserves and dividend of the shareholders. For this purpose, they make use of some of their assets in profitable investments and try to earn maximum income with minimum of variable cost. Use of assets for 'loans and advances' is the most profitable. Confidence on the part of a bank and public is the determining factor. Profitability is possible only when people are confident that the bank will pay them back their money whenever they demand it. These deposits of the people form an asset and enable the bank to operate and earn more income. According to R.S. Sayers, "The profit which is the ultimate object of a commercial bank, is derived from the income attached to the assets it is able to hold and by the public being willing to hold by the banks debts (deposits) as money balances. The profits are greater, the higher the yields of assets it holds."

J. Harvey and M. Johnson maintain that "liquidity and profitability pull in opposite directions. The shorter the period of loan, the greater the bank's liquidity, but the less it will earn by way of interest."

BANKING THEORY

Banking theories are nothing but abstract arguments dealing with the focal point as to how banks should behave in order to reconcile its conflicting goals. But it is also important to note that banking theory is not simply a sort of abstract description of what bankers do. There is an intimate relationship between banking theory and banking

practice - the decisions of bankers are as much influenced by the prevailing theory of banking as the theory is influenced by prevailing banking practices.

We normally discuss four theories of banking. While the first three theories - commonly known as historical theories of banking - deal exclusively with the asset side of a bank's balance sheet, the fourth theory mainly deals with the liability side of a bank's balance sheet. This is because, historically, it was thought that banks do not have any control over the size of its liabilities. But several significant developments in banking practices during the 1960s changed this view, and there emerged a new (fourth) theory of banking - the liability management theory.

Let us consider the historical theories first, and then the contemporary theory.

1. The Commercial Loan Theory of Banking

This is the oldest theory of banking and is also called the Real Bills Doctrine. A discussion of this theory can be found in Adam Smith's *Wealth of Nations* (1779).

The commercial loan theory holds that commercial banks should make only short-term, self-liquidating and productive loans.

Here, a short-term loan would mean a loan maturing in less than one year from when it is first made (the ideal period being about three months). Self-liquidating means that the loan contains within itself its own means of payments. This is to say that the funds for a borrower to repay a loan were supposed to arise out of the very transaction being financed by the particular loan. Productive loans means that the loan is solidly based on 'real' goods as opposed to loans for speculative or purely financial purposes.

In short, the commercial loan theory states that banks should not make long term loans. For example it should not make real estate loans or loans for the purpose of financing the purchase of plant and equipment. Moreover, even short-term loans should not be made unless and until they are backed up by real, physical, tangible goods.

The primary objective of the commercial loan theory was to maintain the stabilization of the banking, system. This is because at that time there were no central banks or deposit insurance corporations. A bank had to remain liquid, solvent, as well as earn a profit on its own; there was no government agency charged with the responsibility of bailing a bank out of trouble.

An example that is commonly cited to illustrate the commercial loan theory is that of a retail toy store that did its peak volume of business in the three months before Christmas. Such a store can borrow from a bank to purchase inventory (toys) in the month of September. And during October, November and December (festival time), the toys can be sold and the bank loan can be repaid out of proceeds of this sale. Thus, a productive loan was taken for a short period, which repaid itself.

However, the commercial loan theory had several shortcomings. The basic weakness of the theory was that it misconceived the nature of what is and what is not

'real'. Taking the above example once again, it is true that toys are tangible (i.e. real), but the fact is that a bank does not make loans on the goods themselves, but on the value of goods. Thus, if the value (i.e. price) of toys goes down, or if they are not sold (for whatever reason), the bank's loan will not be repayable. Speaking generally, there is an element of speculation in any loan.

In addition, the commercial loan theory fails to distinguish between an individual bank and the banking system as a whole. For the individual bank, many loans might be liquid, but these may not be liquid from the point of view of the banking system as a whole. This is because the repayment of one loan often requires the extension of another. So for the banking system as a whole, no net liquidation takes place.

Not only was the commercial loan theory theoretically unsound, it was out of touch with historical reality. We cite the particular case of USA. Around 1850, the industrial revolution had started in the United States. The economic development of the country created heavy demands for capital. As a result, banks were pressurized to make long-term loans. But for the banks, it was a threat to their stability. So many banks tried to compromise by writing what were essentially long-term loans under the guise of a series of short term loans that were automatically renewed at maturity. This resulted in even greater instability in the banking industry, which was resolved only with the setting up of Federal Deposit Insurance Corporation (FDIC) in 1933.

The shortcomings of the commercial loan theory, in both theory and practice, led to the development of more realistic views regarding management of bank assets.

II. The Shiftability Theory

The shiftability theory emerged in the American banking scene towards the end of the 19th century. This theory, however, did not replace the commercial loan theory completely, but only took a more general view, and widened the list of assets that a bank might hold. This is to say that the shiftability theory did not say that commercial loans were inappropriate, but, only held that there were other, better assets that a bank can hold.

This theory provides the idea of liquidity through shiftability, i.e. through the ability to sell off (or shift) assets to others. Thus, a bank can hold short term open market investments (such as treasury bills) and sell all these investments whenever it needs liquidity (money) to payoff its depositors.

The shiftability theory slowly gained ground, as it was realized that commercial loans were not really liquid, and consisted only of shifting of loans from one bank to another. But if, instead, of commercial loans, a bank is holding short-term assets like treasury bills, it is in a better position, as these can be promptly sold as and when the need arises.

With this theory, the liquidity position of a bank consequently came to be closely

associated with the amount of money market instruments that the bank was holding - the so - called secondary reserves.

Historically speaking the early 1900s saw only a few banks making use of this shiftability theory. But the growth of treasury bills in the 1930s, which also coincides with a dearth of opportunities to make good business loans, gave wide sanction to the concept of providing for liquidity by holding short-term securities. And by World War II, money market securities gained considerable ground over loan portfolio, both in practice and in theory.

However, the shiftability theory was not without flaws. It contained the same defect that had plagued the commercial loan theory - reliance on the actions of a third party. Thus, although one bank, or even a few banks, could obtain needed liquidity by shifting its assets the same cannot be true for all the banks taken together. This is because all banks cannot gain additional cash reserves by shifting their earning assets (treasury bills) to each other. Citing the case of the U.S. economy once again, during 1929-33, all the banks wanted to be sellers - and none of them wanted to buy. There was need for some agency outside the banking system which could provide all banks with liquidity they needed. In fact, this was the role for which the Federal Reserve System (of U.S.) was designed, but this agency did not play its role during this period. The result was' the failure of thousands of banks.

However, the shiftability theory, when applied practically, taught the bankers that the problem of liquidity of the whole banking system cannot be solved by commercial banks alone, and the central bank must necessarily play the role of lender of last resort.

III. The Anticipated Income Theory

A third view of how to provide for bank liquidity developed in 1940s. This is known as the doctrine of anticipated income. Although it did not challenge the theory of shiftability, but it focused greater attention on the types of loans appropriate for a bank to make. However, its conclusions were different from that of commercial loan theory in that the anticipated income theory holds that banks could make long-term and non-business loans. This is because the theory held that there is no such thing as a self-liquidating loan. Instead, all loans are repaid out of the future earnings of the borrower, that is, out of anticipated income. So, it is the borrower's ability to repay the loan out of future earning which is of prime importance.

Thus, under the anticipated income theory, it became acceptable for banks to engage in a much broader range of lending.

It may be mentioned here that the doctrine of anticipated income is a method for analysing borrower's creditworthiness. It gives the lender a criteria for evaluating the potential of a borrower to repay a loan in time. However, bank liquidity also means that a bank is capable of raising cash quickly as and when needed. And if the doctrine

of anticipated income is looked upon as a method of evaluating borrower creditworthiness, then it is best to see it as complementary to (and not competitive with) other theories of bank liquidity.

IV. The Liability Management Theory

The 1960s witnessed a change in bank liquidity practices. Until then, banks relied exclusively on asset management for providing liquidity. This is because it was thought that a bank had no control over the size or mix of its liabilities. This is why the previous theories of banking (discussed above) all relied on asset management to supply liquidity.

Starting with the early 1960s, however, banks began increasingly to draw their liquidity from the liability side of the balance sheet. Banks began to adjust their liabilities to suit their needs. Liability management became the most important banking development of the 1960s. But it does not mean that the bank managed only its liabilities and was passive with respect to its assets. The theory continued to recognize that the asset structure of the bank has a prominent role to play in providing the bank with liquidity. The only change was that now banks recognised that they could use its liabilities for liquidity.

Simply speaking, liability management means that when a bank needs money, it "just goes out and buys it." This is to say that the bank borrows the funds it needs. For example, the bank might borrow from central bank (or even other banks), it might issue new CDs (Certificates of Deposit) etc. The money so borrowed can then be used to accommodate the loan demands of customers. It, thus, literally "borrows from Peter to lend to Paul". And as long as "Paul" is willing to pay a higher rate of interest than "Peter" is charging, it is good banking practice.

In the U.S. economy, liability management began with the rapid growth of the federal funds market. In the 1950s and 1960s, banks were put under heavy pressure to meet the credit demands of customers, and hence borrowed reserves from each other. Negotiable Certificates of Deposit (CDs) were the next liability instrument developed by the banking system. The development of the CD market gave banks ready access to non-bank funds because CDs could be sold to corporations, state and local governments, and private individuals.

However, there have been misgivings regarding the liability management theory also. It is said to be suffering from the same flaws as the shiftability theory. Thus, while any individual bank can acquire funds through selling liabilities, the entire banking system cannot—there must be banks that are willing to lend their excess reserves.

Later Developments

These days, banks are increasingly making use of financial models to help and guide them in their decision-making process. Use of financial models implies that the

relationship; between and among the bank's assets and liabilities are specified in mathematical terms, with the objective of making more profits. After the development of the basic model, statistical analysis is used. The model may also be programmed onto a high speed computer and then the consequence of various choices may be observed. The bank can then use the choice whose consequence suits its objectives the best.

It may seem, at first instance, that bank models do not constitute a theory of banking as the other theories discussed earlier. However, it must be remembered that all banking theories try to establish rules of behaviour for banks under various possible circumstances. And the only difference between these theories and banking models is that the latter try to consider the bank as a whole, that is; as a multidimensional unit with a wide variety of choices open to it. But the traditional concerns of bankers for liquidity, solvency, and profits are not ignored. These are built into the models. The models are used to help the banker choose the best path for attaining and reconciling these goals.

Note: Suggested Readings and Questions for Practice are given at the end of the unit.

MONEY MARKET**INTRODUCTION**

Financial markets may be broadly classified as negotiable loan markets and open markets. The negotiable loan market is a market in which lenders and borrowers personally negotiate the terms of the loan agreement. A business person borrowing from a bank and an individual borrowing from a small loan company are examples of negotiated loans. In contrast, the open market is an impersonal market in which standardized securities are traded in large volumes. Buyers and sellers may never meet. Stock market is an example of an open market. The open market provides the binding that ties the country's financial institutions together into an integrated whole. It is only with the open market that we will be concerned with in this and the next lesson.

This lesson is divided into three sections. Basic knowledge about money market and characteristics of a developed money market are discussed in the first section. Section II deals with the various components of money market. Money market in India and its development is a part of section III.

I

Money market is a market for short term (less than one year) loans. Infact, its very name suggests that it is money which is being bought and sold. It is used by business firms for purchase and shipment of inventories, by finance companies to finance consumer credit, by banks to finance temporary reserve shortage, and by government to bridge the gap between tax receipts and expenditure. The money market is not a place but an activity.

A supplier of funds to the money market can be virtually anyone with a temporary excess of funds, for example, a corporation may be accumulating funds for a quarterly income tax payment, and rather than holding the funds in demand deposits (non-interest bearing), the corporation may decide to lend them out for a short term. A commercial bank may know from experience that it will have large seasonal deposit withdrawals shortly but in the meantime it may invest the money in earning assets.

The best way to a clear impression of the money market is to understand the mechanism of the various debt instruments traded in it. The description of the money market involves both the instruments and institutions. All the money markets, though constituted differently, have institutions which have somewhat similar character.

CHARACTERISTICS OF A DEVELOPED MONEY MARKET

A developed money market is one which is comparatively efficient in the sense that it is responsive to changes in demand for and supply of funds in any of its segments. The effects initiated in any part of it, quickly spreads to others without significant time

lag. In order to satisfy these criteria it should have the following characteristics:

(a) Presence of Central Bank

Central bank has a greater capacity of judging the needs of the market as regards its financial requirements and can devise its monetary policy to suit the objectives. It can vary the supply of cash and easily meet the seasonal variations in demand for liquidity by rediscovering the commercial paper. It can supplement this task by varying the minimum reserves to be maintained by the banks, the bank rate and use of selective credit controls etc.

(b) A Developed Commercial Banking System

For a developed money market not only the banks should be well developed and organised, but the public should also have a widespread banking habit. Widespread banking habits of the public enable banks to operate on low fractional reserves.

(c) Variety and Quantity of Financial Assets

It is essential that there should be an adequate supply of a variety of short maturity financial assets. In developed money markets there is an abundance of various financial assets like commercial bills, bills of exchange, treasury bills and so on.

(d) Sub-markets

A developed money market will have developed and sensitive sub-markets. Absence of such markets or lack of their responsiveness to small changes in interest and discount rates, does not make it a developed money market.

(e) Existence of Specialized Institutions

The existence of institutions specializing in particular types of assets help in making the money market competitive and efficient. Acceptance houses and discount houses are important examples.

(f) Contributory Legal and Economic Factors

Appropriate legal provisions go a long way in the development of money market. The transaction costs of commercial bills should be quite nominal. In India, one of the reasons for non-development of bill market happens to be the high stamp duty payable on them. Similarly, the dealers in bills should have a legal protection against default of payment and remedial provisions should not be very time-consuming.

Money market would remain undeveloped if one or more of above conditions are not satisfied.

INSTRUMENTS OF MONEY MARKET

Money market works through market instruments. Let us now discuss various instruments of money market one by one.

Call Money

Call money loans are extremely short term loans which are repayable on demand within a day. They are made by commercial banks and other financial institutions who

can afford to spare funds in large amounts, though for short periods. The maturity period is between 1 to 15 days. The demand for such loans comes from those financial institutions which specialize in discounting or rediscounting bills.

The call money market operates through brokers who keep in constant touch with banks and bring the borrowing and lending banks together. The main function of the market is to redistribute the pool of day to day surplus funds of banks among other banks in temporary deficit of cash. The call money market is a highly competitive and sensitive market. It registers very quickly-the pressure of demand and supply for funds operating in the money market. The funds are borrowed or lent without any collateral security. The rate of interest paid on call loans is called call rate.

Treasury Bills

The market which deals in treasury bills is termed as treasury bill market. These bills are short-term liability of the government. Treasury Bill is a particular kind of finance bill (which does not arise from any genuine transaction in goods) i.e. a promissory note put out by the government of a country. They are issued to meet temporary needs for funds of the government arising from temporary excess of expenditure over receipts. Treasury bills are of two kinds: adhoc and regular. Adhoc means for the particular end or case at hand. Adhoc treasury bills are issued for providing investment outlets to state governments, semi-government departments etc.

Regular Treasury Bills (or ordinary TBs) are sold to general public and banks. They are freely marketable. In India, their buyers are almost entirely commercial banks.

Treasury bills are bought and sold on discount basis. The amount of interest due on it is paid in the form of discount in the price charged for the bill. This price is, thus, lower than its face value by the amount of interest due on the bill. For the government, treasury bills are an important source of raising funds. In India, treasury bill rates are very low, which in turn, keep the interest cost of treasury bill debt to the government very low.

Commercial Bills

The market dealing in commercial bills is known as commercial bill market. These bills are issued by firms engaged in business. Generally, they are of three months maturity. They are like post-dated cheques drawn by sellers of goods on the buyers of goods for value received.

An example of typical bill of exchange is given below :

Patiala, Oct. 15, 2010

Mr. Sharma,

Three months after date please pay to the undersigned or order of the sum of Rupees thirty thousand for value received.

Mr. Khurana

In this example, Mr. Khurana is the drawer of the bill and Mr. Sharma is the drawee. The former has sold the latter goods worth Rs. 30,000/- on three months credit. The seller may need cash now, so he draws a bill and sends it to the buyer for acceptance. The latter, in acknowledgement of his responsibility to make payment on the due date, writes 'accepted' on the bill, or arranges to get the bill accepted on his behalf by his bank. Once the bill has been so accepted, it becomes a marketable instrument. On receipt, the drawer can now sell it in the market for cash. The bank, again, normally comes into picture. The drawer goes to his bank and gets the bill discounted. This simply means that he sells it for cash to the bank which pays him the face value of the bill less collection charges and interest on the amount for remaining life of the bill. The rate of interest charged is known as the discount rate on bills.

A Commercial Bill is, thus, a written instrument containing an unconditional order, signed by the maker directing a certain person to pay a certain sum of money only to, or to the order of, a certain person, or to the bearer of the instrument. Being a negotiable instrument, it can change ownership.

While in developed economies, commercial bills are a major portion of the money market, in underdeveloped countries this is not the case, for various reasons. These economies have a practice of trading through payment rather than buying on credit. Also, for a genuine bill market to develop it is essential that the bills should be drawn in a largely accepted conventional form and the banks and other agencies of repute should be ready to stand guarantee for the credit worthiness of the drawee of the bills.

Commercial Paper (CP)

Commercial paper consists, very simply, of the unsecured promissory notes of large corporations. The corporations are sufficiently well-known so that their credit worthiness is not in doubt. Their promise to pay can consequently be bought and sold in an organised market. The commercial paper generally carries a maturity of 4 to 6 months and is used by the issuers as a supplement to borrowing from commercial banks. These are also known as Industrial Paper, Finance Paper, Corporate Paper, etc. CPs are sold either directly by the issuers to investors or through agents like merchant banks and security houses. In India, CPs are privately placed with investors through banks or financial institutions. These are used to raise short term finance to meet working capital needs. These are issued in domestic as well as international financial markets. These are rarely issued to finance fixed assets or permanent capital.

Certificates of Deposits (CDs)

A CD is a document of title to a time deposit. A certificate of deposit is a certificate given by a commercial bank that certifies that a deposit has, in fact, been made. The certificate stipulates that the deposit cannot be withdrawn before a certain date and that, upon that date, the bank will repay the deposit plus interest. This period is generally

three months. Certificates of deposit are of two kinds : non-negotiable and negotiable. A non-negotiable certificate of deposit must be redeemed by the original depositors. A negotiable certificate of deposit, however, may be resold by the depositor in the money market and may change hands several times before it matures. Whosoever owns the negotiable certificate of deposit on its maturity date, of course, claims the deposit and interest from the bank.

The above mentioned instruments are the basic constituents of the money market. The market operates through these instruments. Development of any economy can also be judged from the development of its money market.

III

MONEY MARKET IN INDIA

Until 1935, the country had no central bank. The government had the right to issue currency. The banking structure was very fragile and bank failure was very common. The money market that existed in pre-independence period was far more undeveloped, than what it is today. Now the Indian money market is a leading money market in third world countries.

Indian money market is broadly divided into two parts, viz. the unorganised and the organised. The unorganised sector of money market comprises the indigenous bankers and money-lenders. They charge comparatively high rates of interest. Unlike the modern banking system there are little business relations among them. The organised sector is fairly integrated. Both private and public sectors constitute the organised sector. The RBI is the central bank, and it is the apex organisation in the Indian money market.

No doubt, the organised sector of the Indian money market is fairly developed and organised, yet it is not comparable to the New York or London money market.

Broadly, the **principal constituents (sub-markets) of Indian money market are** : (i) Call money market, (ii) Treasury Bill market, (iii) Commercial Bill market, (iv) Certificate of Deposit market and (v) Commercial Paper market.

(i) The Call Money Market

Scheduled commercial banks, cooperative banks and Discount and Finance House of India operate in it as lenders and borrowers. As a special case, institutions like Unit Trust of India, Life Insurance Corporation of India, General Insurance of India, Industrial Development Bank of India and the NABARD are allowed to operate in the call money market as lenders. Among the banks, the State Bank of India, on account of a strong liquid position is invariably on the lender side of the market. The call money market, on account of its highly sensitive nature" is considered to be the most appropriate indicator of the liquidity position of the money market. The RBI, therefore, takes note of it in adjusting day to day monetary policy.

The call money market remains largely confined to big industrial and commercial

centres like Mumbai, Kolkata, Chennai, Ahmedabad, Bangalore etc.

(ii) The Treasury Bill Market

The treasury bills are instruments for short term (91 days, 182 days, 364 days) borrowing by the central government. In these days, in India, treasury bills have become a permanent source of funds for the central government, as every year more new bills are issued than those that are retired. Further, every year a part of treasury bills held by RBI is converted into long term bonds. The treasury bill market in India is highly underdeveloped. Except RBI there are no major holders of these bills. Infact, even the RBI is a passive or captive holder of these bills which implies that it is under an obligation to purchase all the treasury bills presented to it by banks and others for this purpose. This has resulted in monetization of public debt and has become a major source of inflationary expansion of money supply. State governments do not issue any treasury bills. Interest on these bills is market governed. Treasury bills are available for a minimum amount of Rs. 25000 and in multiples of Rs. 25000.

(iii) The Commercial Bill Market

In India, this market is highly undeveloped. Generally, cash credit system of bank lending is popular. Among other factors which have prevented growth of genuine bill market are lack of uniformity in drawing bills, high stamp duty on the bills, and the practice of selling on credit without specified time limit. RBI had made efforts to develop a bill market in this country and popularise the use of bills. Its two specific bill market schemes, however, had limited success. The old bill market scheme introduced in January 1952 was not correctly designed to develop a bill market. It merely provided for further accommodation of banks in addition to facilities they had already enjoyed. In order to encourage use of bills the RBI offered loan at a concessional rate of interest and met half the cost of stamp duty incurred by banks on converting demand bills into usance bills. This scheme, however, failed to make any impact.

Not satisfied with the old scheme, the RBI introduced a new bill market scheme in November 1970. The noteworthy features of this new scheme were:

(i) The bills covered under the scheme are genuine trade bills and (ii) the scheme provides for their rediscounting. This scheme really aimed at developing a bill market in the country but has not been very successful.

(iv) The Certificate of Deposit Market

The certificate of deposit instrument was introduced in Indian money market in 1989, with the objective of widening the range of money market instruments and to provide investors greater flexibility in deployment of their short terms surplus funds. The CDs can be issued the scheduled commercial, banks excluding Regional Rural Banks and Local Area Banks. CDs are subject to SLR and CRR requirement. There is no ceiling on amount to be raised by banks. Minimum maturity of CD has been reduced to 15 days w.e.f. 2000-01. Minimum size of issue has been reduced from Rs. 5 lakhs to

Rs. 1 lakh in June 2002 to be accepted from a single subscriber. Larger amounts have to be in multiples of Rs. 1 lakh. In 1992 other financial institutions like IDBI, IFCI etc. were permitted to issue CDs with maturity of 1-3 yrs. However, for banks, the maturity period is between seven days to one year.

(v) The Commercial Paper Market

The commercial papers were introduced in Indian money market in January, 1990. The commercial paper is issued by companies with a tangible net worth of Rs. 4 crores. Maturity of CP is minimum of 7 days and a maximum of upto one year from the date of issue. CPs can be issued in denominations of Rs. 5 lakh or multiple thereof. CP issues are now delinked from working capital. The minimum credit rating shall be P2 of CRISIL or such equivalent rating by other approved agencies like ICRA or CARE. The CPs are issued at a discount to face value and the discount rate is freely determined. The purpose of CPs in Indian money market is to enable high level corporate borrowers to diversify their sources of short term borrowings on the one hand and provide an additional instrument to banks and financial institutions in the money market, on the other.

Problems Facing the Indian Money Market

Money market in India suffers from several defects, as a result of which it is not yet considered as a developed money market. Following are the problems facing this market.

1. Presence of unorganized sector of money market : The Indian money market comprises of several types of private lenders who are not under the control of RBI. Due to this, it becomes difficult for the monetary authority to regulate and implement its monetary/credit policies. This unorganized sector does not differentiate between short and long term finance, or even the purpose of finance. As such, they do not follow the credit policy of the RBI.
2. Seasonal Stringency of Money : The Indian money market suffers from seasonal stringency of money and the resultant high rates of interest. During slack season the banks have surplus funds and suffer as a result of dipping rates of interest. Hence money rates of interest fluctuate widely, adversely affecting the economy.
3. Near absence of Bill Market : A bill market is extremely useful for expanding credit. But despite efforts made by the RBI, the bill market in India is underdeveloped. This is mainly because till recently, banks had to keep large amounts of cash as statutory reserves. There is a general preference for borrowing rather than rediscounting bills and for cash transactions. An underdeveloped bill market also leads to shortage of funds. There is lack of standardization in drawing of bills and hundies in India.
4. Highly volatile call money market : This is another problem of the Indian money

- market. The call money rates fluctuated from as high as 70 percent to 4 percent during 1990-91, although by 2005-06, the fluctuations had been considerably captured (between 8.25 percent and 3 percent). The high rates reflect the huge demand for short term funds by banks specially to meet their CRR requirements.
5. Inadequate money market instruments : The Indian money market does not possess an adequate and continuous supply of short term assets (i.e. money market instruments). As a result banks with surplus funds are unable to invest these profitably in the short period, and those who require short-term funds are unable to raise them.
 6. There are few specialized dealers in short term assets in India who can act as intermediaries between the Government and the banking system. The establishment of Discount and Finance House of India in 1988 has solved this problem but only partially.
 7. There is no co-ordination between the different sections of the money market as a result of which there are differences in the money rates in different sub-markets.

In its organisation and development, the Indian money market is not comparable to either the London money market or the New York money market. It suffers from a number of defects such as lack of integration because the organised and unorganised segments are working separately. The structure of interest rate is not rational due to the lack of adequate coordination between different banking institutions and policy of RBI. The bill market is not fully organised and there is shortage of funds in the money market. Moreover, there are inadequate banking facilities in India.

MAJOR REFORMS IN INDIAN MONEY MARKET

A systematic review of the Indian money market was undertaken by the Vaghul working group in 1987. Since then, a number of steps have been taken to improve the efficiency of the Indian money market. Some of these steps are as follows :-

1. Ceiling on call money rate has been withdrawn. All money market interest rates are, by and large, determined by market forces.
2. Selected institutions are allowed to borrow from the money market on a term basis.
3. The base of call money market has been widened by selective increase in the participants as lenders. Scheduled commercial banks (excluding RRBs), co operative banks (other than land development banks) and Primary Dealers and permitted to participate in call money market both as borrowers and lenders. The institutions who can only lend in call money market are- LIC, NABARD, UTI, mutual funds etc.
4. CDs were introduced in 1989, CPs in 1990, and guidelines relating to them are modified from time to time. Institutions like IDBI, IFCI and ICICI were permitted

to issue CDs with a maturity of one to three years.

5. A number of institutions have been set up like Discount and Finance House of India (DFHI), Securities Trading Corporation of India (STCI) to promote orderly development of money market. They are allowed to participate both as lenders and borrowers in the call money market.

The DFHI was set up in January, 1988 jointly by the Reserve Bank, Public sector banks, and the All India Financial Institutions to deal in short term money market instruments, enlarge the number of participants in the call, short notice, and term money market by allowing financial institutions and mutual funds to participate as lenders. It moderates the volatility in the inter bank call money market by providing liquidity in the market as and when required. The STCI was set up on June 7, 1994 to develop an institutional infrastructure to act as base for an active secondary market in govt. dated securities and public sector bonds. It can also hold short-term money market assets like TBs.

6. Issue of adhoc 91 day TBs to finance the budget deficit of the government was discontinued, and a scheme of Ways and Means Advances (WMA) by the RBI to the Central Govt. was introduced with effect from April 1, 1997. Auction of 91-days TBs commenced from 1993. Also, TBs of various maturities have been introduced.
7. In April 1991, RBI announced the introduction of Money Market Mutual Funds (MMMFs). The main objective was to provide small investors an investing opportunity yielding market related returns, help in broad basing money market by providing more participants, and help in mobilising household savings. The private sector was allowed to set up MMMFs in 1995. Also, UTI, IDBI, ABN Amro Bank and Bank of Madura Ltd. have been given clearance to set up MMMFs. Since March 2000, MMMFs have been brought under the purview of SEBI regulation.
8. The minimum lock-in period for money market instruments was brought down to 15 days.
9. Repurchase auctions (Repos) have been introduced since December 1992 in respect of Central govt. securities. If the banking system experiences liquidity shortage then RBI purchases govt. securities from banks and injects liquidity into the system. Since 1996 RBI has introduced Reverse Repos i.e. it sells govt. securities to banks to help them park their surplus funds. This policy of Repos and Reverse Repos is called Liquidity Adjustment facility (LAF) In Nov. 2005, RBI introduced a Second Liquidity Adjustment Facility (SLAF). First LAF operations are conducted in the forenoons while SLAF are conducted between 3.00pm and 3.45pm. However, the second LAF was abolished w.e.f Aug. 6, 2007. RBI also instituted a new marginal standing facility (MSF) from which scheduled commercial banks can borrow overnight funds upto 1% of net demand and time liabilities.

10. A new short-term instrument known as Cash Management Bill (CMB) was introduced in May 2010 to meet the temporary cash flow mismatches of the Government. These are non standard, discounted instruments issued for maturities of less than 91 days.

Despite these reforms, the Indian money market is yet to acquire depth. Interest rates continue to be highly volatile. Moreover, the grand scheme of liberalisation and globalisation of money market has brought up many distortions without enhancing efficiency of institutions and allocation of resources. In our economy where the rural sector dominates, and the unorganised money market still plays an important role, money market reforms should start from reorganising rural financial structure.

Suggested Readings:

1. L.M. Bhole : Financial Institutions and Markets
2. Suraj B. Gupta : Monetary Economics: Theory, Institutions and Policy.
3. Datt and Mahajan : Datt and Sundharam Indian Economy.
4. Misra and Puri : Indian Economy.

Questions for Practice

1. Discuss the constituents of Money Market.
2. Write short notes on:
 - i. Problems of Indian money market.
 - ii. Reforms in Indian money market.
 - iii. Call money market
 - iv. Commercial Paper market.

CAPITAL MARKET

Capital market is the market for long term funds, just as the money market is the market for short term funds. It refers to all the facilities and the institutional arrangements for borrowing and lending term funds (i.e. medium-term and long term funds). It does not deal in capital goods, but is concerned with the raising of money capital for purpose of investment. The demand for long term money capital comes predominantly from private sector manufacturing industries, agriculture, and from the government largely for the purpose of economic development. As the central and state governments are investing not only on economic overheads as transport, irrigation and power development, but also on basic industries and sometimes even consumer goods industries, they require a substantial sum from the capital market. The supply of funds for the capital market comes largely from individual savers, corporate savings, banks, insurance companies, specialized financial agencies and the government.

The capital market can be usefully divided into the primary market and the secondary market. The primary market deals with the selling of new securities when they are first issued by the issuing corporation. Since many of the initial buyers of these securities will eventually want to resell them, there is a secondary market for previously issued securities. The stock market, for example, is a secondary market in corporate securities.

THE PRIMARY MARKET

When a corporation decides that it wants to acquire new funds from the outside, it will frequently do so through the intermediation of an investment banker. Investment bankers are specialists in the marketing of new securities. They advise the corporations in the design of the security - what type of security should it be - common stock, preferred stock, or bond; if a bond, what rate of interest should it bear, what should be its maturity provisions, and so on - so that it will best serve the needs of the corporation and the buying public. Although there are a number of possible arrangements, the investment banking house will typically underwrite a new issue of securities. The investment house assumes a substantial measure of risk in an underwriting operation, large issues of new securities usually will be syndicated among several investment banking firms.

Many corporations engage in the private placement of securities. Private placement means that the issuer of securities sells them directly to the investors, without the underwriting services of an investment banker. This method of marketing new issues has a number of advantages, foremost among these are that it is cheaper since underwriting costs are avoided.

THE SECONDARY MARKET

The secondary market in corporate securities can be sub-divided into two parts, the registered stock exchange and over-the-counter market.

(1) Stock Exchange:

Stock exchanges are voluntary associations of members who come together for the purpose of buying and selling, for the general public, the securities of the big corporations. Only certain securities are traded on the exchanges - the so-called listed stocks - and these are bought and sold by auction. Since the members of exchanges generally have branches throughout the country, the stock exchanges are truly a national market in which virtually anyone may participate.

(2) Over-the-Counter Market

The over-the-counter market is the market for those securities not listed on the stock exchanges. Used in the broadest sense, it includes all transactions' in securities, other than those taking place on the national stock exchanges. The over-the-counter market has very low entry barriers, and traders may range in size from very large houses doing international business, to one-person firms that trade only in local markets.

Economic Functions of the Secondary Market:

The role of secondary market is to make the primary market possible. Suppose, for example, a corporation needs to buy a machine with a life expectancy of twenty years. It may want to issue a twenty year bond to do this. But who would buy such a bond if they had it for full twenty years. With a secondary market, the initial purchaser of the bond knows that, if necessary, it can be resold to someone else in a year or two. In this fashion, the secondary market in securities is said to give liquidity to primary issues.

GOVERNMENT SECURITIES MARKET :

In most of developed and underdeveloped countries, large quantities of government securities are issued, to finance government operations and to re-finance maturing debt. This mechanism is sometimes known as debt management. The treasury can issue new government debt instruments and sell them to financial institutions and general public. (These securities are not available to general public in most of the less developed countries).

These government securities can be of two types :

- (i) Marketable government securities
- (ii) Non-Marketable government securities

The securities that can be sold in the secondary market are termed as marketable securities and those that cannot be sold in the secondary market are known as non-marketable securities. The investors in government securities are the commercial banks, LIC, GIC and provident funds. The latter are often compelled by law to invest a certain portion of their funds in these securities, and, therefore it is referred to as the captive market for government securities. This market is an over the counter market.

THE INTERNATIONAL CAPITAL MARKET

The central feature of such a market is that it makes possible the lending and borrowing of the funds in a currency outside the country of its origin. For example, it became possible for an Englishman, in London, to lend dollars to another Englishman in London. The capital market aspect of such a market is called the Eurobond market.

The Eurobond market is a market where bonds are denominated in a currency other than that of the country in which they are issued. For example, a French firm may engage a German investment banking syndicate to sell dollar-denominated bonds, and Italian and English investors may be the principal buyers of such bonds. It is particularly in this broader sense that Eurobond market is international in character.

CAPITAL MARKET IN INDIA

Indian capital market before independence could not develop, since there were few companies. Most of the British enterprises in India looked to the London capital market for funds. Individual investors were few and limited to the upper class in urban areas. Specialized issue houses could not develop in India and managing agency system performed to some extent the function of promotion, issue and underwriting of new capital issue.

Rapid expansion of the corporate and public enterprises since 1951 has necessitated the development of capital market in India. Indian capital market is divided into the gilt edged market and industrial or corporate securities market. The gilt edged market refers to the market for the government and semi-government securities backed by Reserve Bank of India. The securities traded in this market are stable in value and subscribed by the banks and other financial institutions. The industrial securities market refers to the market for shares and debentures of companies.

The government securities differ from industrial securities market in many important respects:

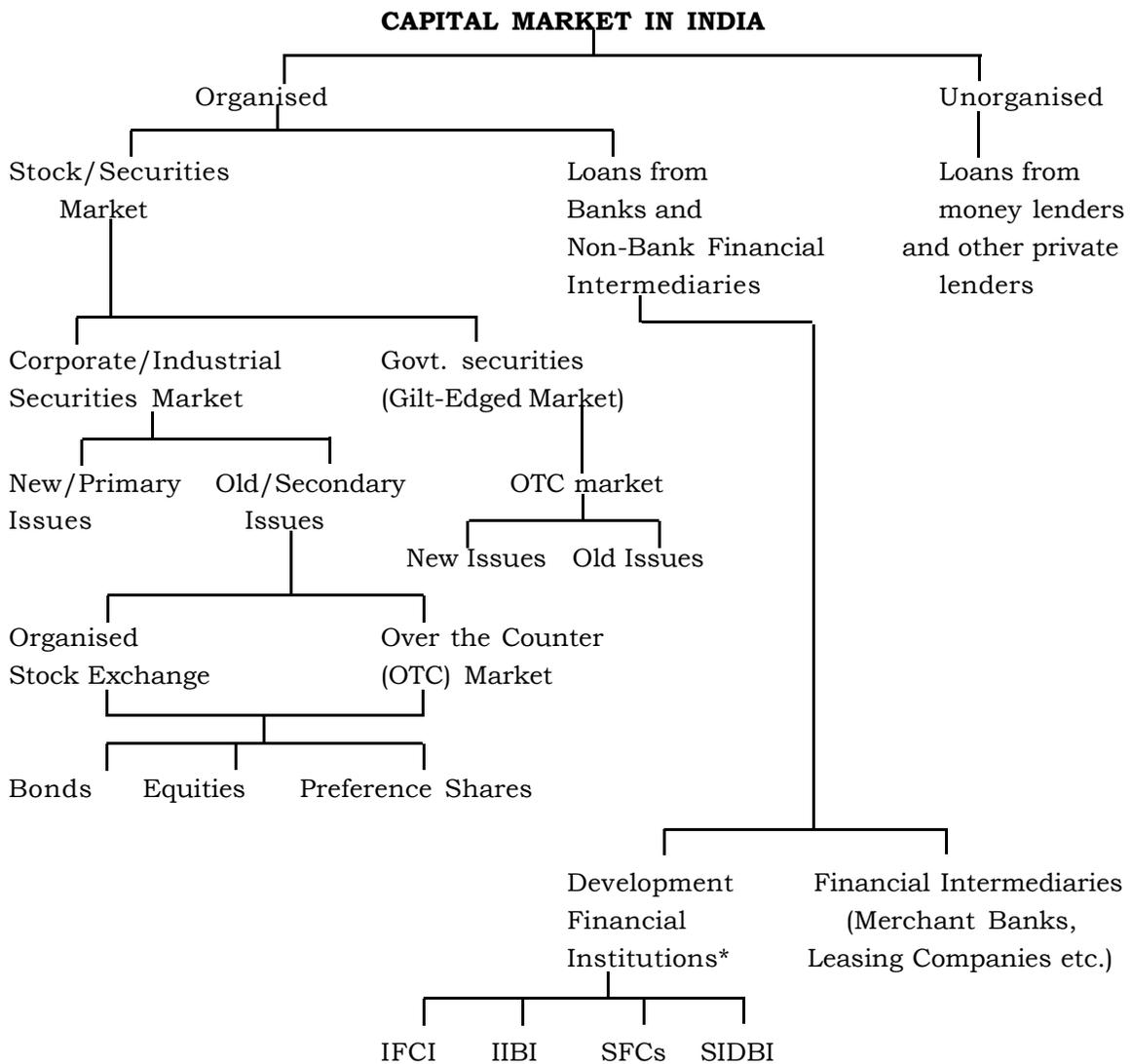
- (i) More uncertainty regarding yield, management, addition to capital etc. is involved in industrial securities.
- (ii) Financial institutions are compelled by law to invest a specified part of their demand and time liabilities in government securities.
- (iii) The average value of the transactions in the government securities market is very much larger than in the case of shares and debentures of the companies.
- (iv) Gilt edged market is 'over-the-counter' market.
- (v) RBI plays a dominant role in the gilt edged market through its open market operations.

Capital market, in India, started growing after independence. A very important indicator of the growth of the capital market is the growth of joint stock companies or the corporate sector. The volume of capital market transactions has increased sharply; its functioning has been diversified. New financial instruments have appeared in the

market.

Specialized financial institutions set up after independence to promote the industrial growth have been doing a useful work in subscribing to the shares and debentures of new and old companies, giving loan assistance, underwriting new issues and so on.

The following table will give us an idea about the structure of capital market in India:



* IDBI and ICICI are no longer included, as these are banks now.

The **stock/securities market** deals in long-term government and non-government securities.

The **corporate securities** are instruments for raising long-term corporate capital from the public. The **new issue market** arranges for the raising of new capital by corporate enterprises (old and new). It takes the form of equity shares, preference shares or debentures. The services of a network of specialized institutions is required to act as underwriters and stock brokers. In India, such institutions are ICICI, IDBI, GIC, LIC, UTI etc. There are three main ways of floating new issues: (a) by issue of prospectus to public (giving details about the company, issue, underwriters etc.); (b) by private placement with a few big financiers. This saves the company the expenses of public placement, and is also time saving; (c) by the rights issue to existing shareholders in a fixed proportion to their shareholding. Such an issue is usually offered at a discount from the going market price of the already trading shares of the company.

The **old issue market** deals in existing securities. It also acts as an indicator of investment climate in the economy. There are two segments of the old issue or secondary market – (a) the organized stock exchange, and (b) over the counter market.

The **stock exchange** is an organization for orderly buying and selling of listed (approved) existing securities; an association of persons or firms to regulate and supervise all transactions rules, regulations and standard practices to govern all market transactions, authorized stock brokers, and an exchange floor or hall where stock brokers or their authorized agents meet during fixed business hours to buy and sell securities. Only listed securities are traded on stock exchange. The listing (or approval) depends on size of issue, whether it is widely held by public, timely production of annual accounts etc*.

The **over-the-counter (OTC) market** deals in securities not listed on an organised stock exchange. These are securities of small companies and have only a limited market. Their prices are determined through direct negotiations between stock brokers and not through open bidding (as in the case of listed securities). OTC market was established in India in 1992. It operates at Mumbai with regional windows at other metropolitan cities.

The **gilt-edged market** is the market in government securities or securities guaranteed by the government. The latter includes securities issued by local authorities and autonomous government undertakings like banks, state electricity boards etc. The market is known as gilt-edged because these securities are of best quality and do not suffer from risk of default. Also, these are highly liquid. The Reserve Bank of India (RBI) manages the entire public debt of the central and state governments and keeps the market informed through recognized brokers about buying and selling price, keeping

* To be able to trade a security on a certain stock exchange; it must be listed on the respective stock exchange as per the guidelines issued by the exchange. Companies have to fulfill certain conditions before their securities can be traded on the stock exchange.

on ready sale securities of various maturities.

The **Development Financial Institutions** (DFIs) have lost much of their sheen due to the merger of IDBI with IDBI-bank, and that of ICICI with ICICI-bank. However a few DFIs are very briefly discussed below.

The **IFCI (Industrial Finance Corporation of India)** was established in 1948 for providing medium and long term credit to industry. It assists industries engaged in manufacturing, mining, construction, shipping and in generation and distribution of electricity. It also provides financial assistance to leasing and hire purchase concerns in corporate and cooperative sectors.

The **IIBI (Industrial Investment Bank of India)**, initially known as Industrial Reconstruction Corporation of India (IRCI), and then Industrial Reconstruction Bank of India (IRBI), was set up to rehabilitate sick industrial units by tackling their technical, financial and administrative problems, and also providing a solution to labour management problems.

The **SFCs (State Financial Corporations)** are state level agencies for small and medium sized industries. The first SFC was set up in Punjab in 1953. The SFCs provide loans and advances upto 20 years. They also provide underwriting facilities and seed capital assistance.

Commercial banks are important constituents of the Indian capital market; but their operations have so far been confined to the purchase and sale of government securities. Their holding of industrial securities viz; shares and debentures are very small. In recent years, banks have been increasing their participation in term lending through subscribing to the shares and debentures of specialized financial institutions. They are also setting up financial subsidiaries to provide services as merchant banking, mutual funds, leasing companies etc. to mobilize funds from investment in industrial securities.

Merchant Banking :*

A few merchant banks have been set up by private financial service companies in association with foreign banking and money market institutions and some have been set up by firms and individuals engaged in brokerage and financial advisory business.

Merchant banks in India manage and underwrite new issues, they undertake syndication of credit, they advise corporate clients on funds raising and other financial aspects. Unlike the merchant banks abroad, Indian merchant banks do not undertake banking business viz. deposit banking, lending and foreign exchange services. In India, the merchant banks are subject to the regulation of SEBI.

* We have already studied about these in detail in semester III

Leasing and Hire Purchase Companies*

Leasing has proved a popular financing method for acquiring plant and machinery specially for small and medium-sized enterprises. Their growth is due to the advantage of speed, informality and flexibility to suit individual needs. The Narasimham Committee had recognised the importance and growing role of leasing and hire purchase companies in the financial intermediation process.

Mutual Funds*

Several public sector banks and financial institutions have set up mutual funds on a tax exempt basis, virtually on the same footing as UTI. They have attracted strong investor support and have shown significant progress. The government has now decided to throw the field open to the private sector and joint sector. At present, SEBI has the authority to lay guidelines and supervise and regulate the working of mutual funds. The guidelines issued by SEBI relate to advertisement and disclosure etc'. The investors have to be informed about the status of their investments in equity, debentures, government securities etc.

Venture Capital Companies*

There is significant scope for these in the context of emergence of technocrat entrepreneurs who have technical competence and expertise but lack financial capital. The technocrat entrepreneurs need the support of venture capital companies. The importance of venture capital companies is to give commercial support to new ideas and the introduction of new technologies. There is a high degree of risk involved in venture capital financing. Venture capital financing is one of the more recent entrants into the Indian capital market.

Apart from these, government of India has been instrumental in setting up a series of new financial intermediaries to serve financial needs of commerce and trade in the area of venture capital, credit rating and leasing etc. We refer to :

- (i) Risk Capital and Technology Corporation (RCTC) which provides assistance in the form of risk capital and technology ventures,
- (ii) Technology Development and Information Company of India Ltd, to sanction project finance to new technology ventures. (Now known as ICICI Venture Funds Management Co, Ltd.)
- (iii) Infrastructural Leasing and Financial Services of India Ltd. to focus on leasing of equipment and infrastructural development.
- (iv) The Credit Rating Information Service of India Limited (CRISIL) to undertake the rating of fixed deposit programme, convertible and nonconvertible bonds & debentures and credit assessment of companies.
- (v) Stock Holding Corporation of India Limited to help in the transfer of shares, debentures and other securities by replacing the present system which involves

* We have already studied about these in detail in semester III

voluminous paper work.

All these institutions have been set up after the mid eighties and are of special importance for the Indian capital market.

Stock Exchange in India

For the existence of the capitalist system of economy and for the smooth functioning of the corporate form of organisation, the stock exchange is an essential institution.

The first organised stock exchange in India was started in Bombay when the Native Stock Brokers Association - now known as Bombay Stock Exchange - was formed by the brokers in Bombay. In 1894, the Ahmedabad Stock Exchange was started to facilitate dealings in the shares of textile mills there.

The Calcutta Stock Exchange was started in 1908 to provide the market for shares of plantation and Jute mills. The number of stock exchanges rose from 7 in 1939 to 21 in 1945, under the Securities Contract (Regulation) Act 1956, the Government of India has so far recognised 15 stock exchanges. Mumbai is the premier stock exchange in the country and nearly 70% of all transactions in the country are done in that exchange.

Securities and Exchange Board of India (SEBI)

To overcome the shortcomings and drawbacks in Indian capital market particularly the defects of stock exchanges like weak managements and to regulate the capital market, the Government of India repealed Capital Issue Act 1947, abolished the office of the Controller of Capital Issues (CCI) and set up SEBI in 1988.

Initially, SEBI was setup as non-statutory body. In January, 1992 it was made a statutory body. SEBI was authorised to regulate all merchant banks on issue activity, lay guidelines and supervise and regulate the working of mutual funds and, oversee working of stock exchange in India. In 1995, SEBI was given more powers for the development of the capital market. It was empowered to file complaints in courts and to notify its regulations without prior approval of government. It was also empowered to impose monetary penalties on capital market intermediaries and participants on violations. SEBI has the power to summon attendance of and call for documents from all categories of market intermediaries. SEBI had made efforts to introduce practices and greater transparency in the capital market in the interest of investing public and the healthy development of the capital market.

CAPITAL MARKET REFORMS

(A) Primary Market Reforms : The following primary market reforms have been introduced :

1. Companies issuing capital in the primary market are now required to disclose all material facts and specific risk factors with their projects. SEBI has also introduced a code of advertisement for public issues for ensuring fair and truthful

disclosures.

2. To reduce the cost of issue, SEBI has made underwriting of issue optional, subject to the condition that if an issue was not underwritten and was not able to collect 90% of the amount offered to the public, the entire amount collected is to be refunded to the investors.
3. Merchant banking has been statutorily brought under the regulatory framework of SEBI. The merchant bankers have now a greater degree of accountability in the offer document and issue process.
4. SEBI has advised stock exchanges to amend the listing agreement to ensure that a listing company furnished annual statement to the stock exchanges showing the variations between financial projections and projected utilization of funds in offer documents and the actual utilization. This would enable shareholders to make comparisons between promises and performance.
5. The government has now permitted the setting up of private mutual funds and a few have already been set up. To improve the scope of investments by mutual funds, the mutual funds are permitted to underwrite the public issues.
6. Since 1992, the GOI allowed Indian companies access to international capital markets through dollar and Euro equity shares. GDR issues are also launched for the same purpose.
7. The government of India has also liberalized investment norms of NRIs so that NRIs and overseas corporate bodies can buy shares and debentures without the permission of RBI.
8. The requirement to issue shares at a par value of Rs. 10 and Rs. 100 has been withdrawn. But shares cannot be issued in the decimal of a rupee.
9. The Government has allowed Foreign Institutional Investors (FII), pension funds, mutual funds, investment trusts, assets or portfolio management companies etc. to invest in the Indian capital market provided they are registered with SEBI.

B. Secondary Market Reforms: Over the years, the following secondary market reforms were introduced in Indian Capital Market.

1. Three new stock exchanges at the national level were set up in the 1990s. These are Over the Counter Exchange of India (1992), National Stock Exchange of India (1994), and Inter-Connected Stock Exchange of India (1999).
2. The process of dematerialisation of securities through the depository system and their transfer through electronic book entry is pursued vigorously. For this, the National Securities Depository Ltd. (NSDL) was set up in 1996, and the Central Securities Depository Ltd. (CSDL).
3. Issuing companies are required to make continuing disclosures under the listing agreement. All listed companies are required to furnish to stock exchanges and

- also publish unaudited financial results on a quarterly basis. Disclosure of material information is to be made available to public also.
4. Stock exchange has undergone major structural reforms. Boards of stock exchange have been made broad-based. Stock exchanges, brokers and sub-brokers have been brought under the regulatory purview of SEBI.
 5. With a view to investigate' frauds in the stock market using a multi disciplinary team of experts, it has been decided to set up a serious Fraud office (SFO) in the Department of Company Affairs.

The government is arming SEBI with all necessary powers to control and regulate the securities market on the one side and effectively protect the interest of the shareholders on the other. To resolve the conflicts, of interest in the governance of various stock exchanges, new governance mechanisms with a separation between, ownership, management and trading rights has been evolved.

SUGGESTED READINGS

1. L.M. Bhole : Financial Institutions and Markets : Structure, Growth and Innovations
2. Datt and Mahajan : Datt and Sundharam Indian Economy (latest edition)
3. Govt. of India : Economic Survey (2012 onwards)
4. Suraj B. Gupta : Monetary Economics; Institutions, Theory and Policy

QUESTIONS FOR PRACTICE ONLY

1. Define a capital market. Discuss its structure.
2. Discuss the reforms in the Indian capital market.
3. Write short notes on:
 - i. Difference between money market and capital market.
 - ii. SEBI.

Lesson No. 1.4

Infrastructure in India (Power and Energy)**1.4.1 Introduction****1.4.2 Objectives of the lesson****1.4.3 Power or Electricity****1.4.4 Coal****1.4.5 Oil and Gas****1.4.6 Atomic Energy****1.4.7 Energy Crisis****1.4.8 Conclusion****1.4.9 Short answer type questions****1.4.10 Long answer type questions****1.4.1 Introduction**

Development of a country depends very much on the availability of its infrastructural facilities. The development of agriculture and industry depends solely on its infrastructure. Without having a sound infrastructural base a country cannot develop its economy. More important and difficult job in the development process of the country is to provide the basic infrastructural facilities. Infrastructure is the concrete, tangible structures, and areas such as roads, building or power supplies, which helps facilitate the smooth operation of a place. This place could be a small business enterprise or a state. Whatever you need to create an organized living and working space—such as houses, water supply, schools, corporate buildings etc. is infrastructure.

1.4.2 Objectives of the lesson

In the present chapter, we propose to discuss the following constituents of infrastructure and their related problems and issues like, power or electricity, Coal, Oil and gas, Atomic energy, energy crisis in India, energy strategy.

1.4.3 Power or electricity

Electricity and power generation play a crucial role in economic development. As noted by the Draft Fifth Five Year Plan, "Electricity is the most versatile form of energy and provides an important infrastructure for economic development. It is a vital input for industry and agriculture, and is of particular importance to a developing rural sector which needs more power for its agricultural operations, for its small-scale and agro-industries. All sectors of the economy need electricity for their common needs of water supply, transport, communication and domestic lighting. Given the large-scale dependence on lift irrigation for food production. food processing and preservation industries, the increase in the power-intensive industries such as aluminium, fertiliser, petrochemicals, etc., and the increasing dependence on electric traction for transport, there is hardly any community or sector which is not affected by a power shortage today. *The future development of the country, therefore, will depend upon the rate of growth of power generation capacity.*"

Expansion of Generation Capacity

There has been considerable expansion in generation capacity during the period of planning as would be clear from the fact that the total installed generating capacity in the country rose from only 2,300 MW in 1950 to as high as 3,26,649 MW as at the end of March 2017. Electricity generated rose from 55.8 billion KWh in 1970-71 to as high as 264.3 billion KWh in 1990-91

and further to 1,235 billion KWh in 2016-17. There was a corresponding expansion of the transmission and distribution networks also. In order to facilitate grid operation and transfer of power from surplus to deficit areas, construction of inter-state and inter-regional lines was undertaken. These developmental though quite impressive in themselves, left a gap between the demand for and the supply of electricity. Consequently power shortages have become a normal phenomenon and almost every part of the country. According to the Planning Commission, this situation has arisen because of the slippages in the capacity additions, unsatisfactory performance of the thermal stations and partly due to non-completion of transmission lines.

Keeping in view the adverse effects of power shortage on the productive activity in bygone years, attempts have been made to accelerate the pace of power development. To meet the projected power demand by 2012, an additional capacity of 78,700 MW was envisaged in the Eleventh Five Year Plan of which 19.9 per cent was hydel, 75.8 per cent thermal and the rest nuclear. This was later revised to 62,374 MW comprising 8,237 MW hydro, 50,757 MW thermal and 3,380 MW nuclear power. However, the actual capacity addition during the Eleventh Plan was only 54,964 MW. The target for additional capacity addition in the Twelfth Plan was kept at 88,537 MW. According to the Annual Report 2016-17 of the Ministry of Power, actual accomplishment exceeded this target - actual achievement as on December 31, 2016 being 92,423 MW.

Problems in the Electricity Sector

The data given above show that while there has been a marked expansion in power generation capacity, there have been substantial gaps between targets

and achievements. The electricity sector faces a number of problems, some of which are highlighted below:

1. *There has been an inordinate delay in installing and commissioning of projects.* The causes of these delays are preconstruction hold-ups {e.g., land acquisition and inter-state water disputes}; poor project management; late delivery of structural steel, cement and power equipment; labour disputes; funding constraints; and technological change as reflected in the progression of unit sizes of thermal plants.
2. State Electricity Boards (SEBs) face a number of problems like poor financial and commercial performance which has crippled their capacity to finance future programmes; inability to pay their full dues to the Central Power Utilities which has adversely affected the latter's future investment plans; managerial inefficiencies; and heavy T&D (transmission and distribution) losses. The heavy T&D losses of SEBs are caused by a variety of problems, including energy sold at low voltage, sparsely distributed loads over large rural areas, inadequate investments in the distribution system, improper billing and theft.
3. *Cost recovery in distribution is very poor.* Data show that revenues from selling electricity in most States fall short of buying or producing it. Many State Governments are providing electricity at very low rates to the agricultural sector (some States are even providing it free) with the result that the burden of subsidy is very high.

It may also be noted in passing that cross-subsidisation adversely affects the competitiveness of the business sector. While electricity is supplied free or at very low rates to the agricultural sector and below cost to the household sector, industrial sector is charged tariffs that are much above the cost of supply and about ten times greater than agricultural tariffs. As

a result of cross-subsidisation, **the price of electricity for Indian households is amongst the lowest in the world, whereas the price paid by Indian industry is among the highest in the world.** "In conjunction with irregular and low quality power, this reduces the competitiveness of the business sector."

4. *On account of the above reasons and general inefficiency in operations, the commercial losses of SEBs rose considerably over the years. This would be clear from the fact that the aggregate losses of SEBs without subsidy were as high as 20,860 crore in 1992-93 and these rose further to 93,868 crore in 2011-12 (they were placed at 71,271 crore in 2013-14).*

Sources of Power (Electricity)

There are five major sources of power, *viz.*, water, coal, oil, gas and radioactive elements like uranium, thorium and plutonium. Electricity generated from water is known as hydro-electricity. Coal, oil and gas are sources of thermal power. Atomic energy is generated from uranium, thorium and plutonium.

1. **Hydro-electricity or Hydel Power:** The share of hydel generation in the total energy generated in the country was 46.8 per cent in 1980-81. Since then it steadily declined and was 9.9 per cent in 2016-17.

As per the reassessment study carried out by the Central Electricity Authority (CEA), the identified hydroelectric potential of the country is 1,45,320 MW.

The hydel power resources are unevenly distributed in India. Punjab, Himachal Pradesh, Jammu and Kashmir, Kerala, Karnataka and the States of the North-east have substantial hydel power potential. Bihar, Rajasthan, Madhya Pradesh and West Bengal have very little hydel power potential. Andhra Pradesh, Uttar Pradesh, Assam, Maharashtra and Tamil Nadu may

not have large hydel power potential but if the available hydel power resources of these States are fully harnessed, they can meet a substantial portion of their demand for electricity.

The development and distribution of hydel power depends on supply of water in rivers, lakes, reservoirs, dams, etc. Rainfall and snow are the two major sources of water in the rivers of this country. Snowfed rivers of the North India have perennial water supply, while water in the rainfed rivers of the South is stored in dams or reservoirs and released regularly to generate electricity. Since massive investment is required to build dams and powerhouses and for their maintenance, these power projects have been undertaken in the public sector.

2. Thermal Power: The development of thermal power plants which use coal, oil or natural gas to generate electricity is common where these fuels are available. In the industrialised countries of the West, thermal power accounts for more than 60 per cent of the total power generated. The generation of thermal power, however, causes pollution. Further, the fuels used to generate thermal power are exhaustible. In the case of thermal plants, the initial cost is generally low but their maintenance cost and power generation costs are heavy.

In India, thermal power has been developed on an extensive scale. In 2016-17, share of thermal plants in gross power generated by the power utilities was 87.0 per cent (data for thermal power includes renewable energy also). In India, since oil resources are rather limited, the main source of thermal power is coal which is the most polluting fuel having disruptive effect on environment. At present, about three-fourths of coal production is used for power generation. India accounts for 5.7 per cent of the proved resources of coal in the world. These coal reserves are non-renewable and are exhaustible.

Therefore, in future, attempts should be made to reduce dependence on coal for power generation.

3. Nuclear Power: The share of nuclear power in total power generation is presently very little. In 2016-17, the share of nuclear power in total power generated by the power utilities was just 3.1 per cent.

UDAY (Ujwal DISCOM Assurance Yojana). The government formulated and launched the UDAY scheme for financial turnaround of power distribution companies on November 20, 2015. *The scheme envisages reduction in interest burden, cost of power and Aggregate Technical & Commercial (AT&C) losses.* 27 States/Union Territories have already come under UDAY. As per UDAY scheme, the State governments are allowed to take over 75 per cent of power distribution companies (DISCOMs) debt and pay back lenders by issuing bonds. The remaining 25 per cent of the debt is to be paid back through DISCOMs issued bonds. As on September 30, 2015, total debt of all State owned DISCOMs was 3.95 lakh crore.

After the introduction of UDAY, the primary focus has been given on billing and collection efficiency of DISCOMs. According to *Economic Survey 2016-17*, State power distribution companies have started reporting handsome savings and improvements in operational efficiency under the UDAY. Many States have also shown improvement in terms of electricity access to unconnected households, distribution of LEDs under UJALA, feeder metering and distribution transmission (DT) metering both in rural and urban areas after the introduction of UDAY.

1.4.4 COAL: Coal has been considered as the major source of energy in

India. Coal-based generation of power constitutes around 80 per cent of thermal generation and around 66 per cent of the total generation of power. The geological coal reserves of the country have been estimated at 301.6 billion tonnes (bt) as on April 1, 2014. Over the past four decades, intensive exploratory efforts have increased our knowledge of coal reserves. Under successive plans, various measures were introduced to improve mining techniques, promote conservation, optimise utilisation and stimulate research and development encompassing various facets of the coal industry. Coal mines were nationalised in the early 1970s. This radical move paved the way for the introduction of newer technologies, standardisation of equipment and creation of infrastructural facilities.

The Eighth Plan had fixed the target for coal production at 308 million tonnes. As against this, the actual production of coal in 1996-97 was only 285.7 million tonnes. While the Ninth Plan laid down the target for coal production at 370.6 million tonnes in 2001 -02, the actual production in this year was only 323 million tonnes. The Tenth Plan kept the coal production target in 2006-07 at 405 million tonnes while actual achievement was 431.0 million tonnes.

The Eleventh Plan had initially fixed the target for coal production at 680 million tonnes but this was later scaled down to 630 million tonnes. However, the actual coal production in 2011-12 (the last year of the Eleventh Plan) was only 540 million tonnes. Since the demand for coal in this year was 640 million tonnes, there was a large demand-supply gap of 100 million tonnes. This adversely affected the coal supplies to end consumers, particularly the power sector. Coal production in 2016-17 (the last year of the Twelfth Plan) was 659 million tonnes.

To increase the production of coal, following policy measures have been announced in recent times:

1. New Coal Distribution Policy was notified on October 18, 2007.
2. The royalty rates on coal and lignite were revised in July 2007 on the basis of a formula consisting of *ad-valorem* plus a fixed component.
3. To ensure the free play of market forces, a system of e-auction for sales of about 20 per cent of the total production has been introduced.
4. For securing metallurgical coal supplies overseas by the PSUs, a proposal for formation of a Special Purpose Vehicle (SPV) has been approved. The CIL (Coal India Ltd.) has committed to contribute 1,000 crore in the SPV as equity out of the total authorised capital of 3,500 crore.
5. For increasing the output of washed coking and non-coking coal, CIL has envisaged setting up of 20 new coal washeries for an ultimate raw coal throughput capacity of 111.10 million tonnes per annum with an estimated capital investment of 2,500 crore.
6. For increasing production from underground mines, initiatives like identification of high capacity underground mines for development with latest technology, restart of mining in abandoned mines, forming joint ventures with reputed mining companies, introduction of high wall mining and upgradation of equipment size, etc., are being undertaken.
7. The government allocated 218 coal blocks with geological reserves of about 50,000 million tonnes to public/private companies. As far as the process of allocation is concerned, **a CAG Report tabled in Parliament in August 2012 alleged that it was done in an arbitrary manner causing a massive .1.86 lakh crore loss to the**

exchequer (the coal scam is frequently referred to as 'Coalgate scam'). Open bidding method was not adopted and large grafts in coal blocks allocation cannot be ruled out. In its judgement dated August 25,2014, the Supreme Court held that "the allotment of coal blocks made by the Screening Committee of the Government of India, as also the allotments made through the Government dispensation route are arbitrary and illegal". Accordingly, ***in its judgement delivered on September 24, 2014, the Supreme Court cancelled all but four of the 218 coal block allocations.***

Coal mining was first started at Raniganj in West Bengal in the second half of the eighteenth century. At present, coal deposits are chiefly located in Jharkhand, Odisha, Chattisgarh, West Bengal, Madhya Pradesh, Andhra Pradesh and Maharashtra. Coal industry in India is now about two hundred years old. At present, it is facing a number of problems, more important being the deterioration in financial performance, rising capital cost and time overrunning and inability to meet the growing demand.

1.5.5 Oil and gas

In spite of the fact that known oil and gas reserves in this country are limited, over the years dependence on this source of energy has increased considerably. Some increase in consumption of petroleum was inevitable with the industrialisation and development of transport system and had to be met partly by raising the domestic output and partly by the import of crude oil. But there was no justification for creating petroleum use oriented industrial and transport system. Having developed such a system, the government felt the need for oil exploration on an extensive scale to

establish adequate indigenous resources. The Oil and Natural Gas Corporation Ltd. (ONGC), and the Oil India Limited (OIL) were established in 1955 and 1959 respectively to undertake this task. Over the years, their efforts have resulted in encouraging results. By the end of the Third Plan, India's total initial recoverable reserves were about 172 million tonnes. During the Fourth Plan, the ONGC went for offshore drilling and this marked the beginning of a new chapter in the history of India's oil industry. By the end of 1977 about 452 million tonnes of recoverable reserves were established. During the last three decades, oil exploration work was accorded a high priority and the capabilities of the ONGC and the Oil India were fully exploited. As a result of all these efforts, balance recoverable crude oil reserves are now estimated at 775.0 million tonnes. At present our proven reserves of oil represent only 0.43 per cent of the world's proven oil reserves. At current rates of production, existing oil reserves will last for about 25-26 years.

The production of crude oil was around 0.25 million tonnes in 1950-51. It has risen considerably over the years and stood at 36.0 million tonnes in 2016-17. Up to 1975-76, the production of oil was exclusively from the on-land fields of Assam and Bombay. Since the mid-1970s, Bombay High offshore fields have made increasing contribution. In 2016-17, the production of the offshore fields was 18.4 million tonnes. However, despite considerable increase in the production of crude oil during the period of planning, dependence on imports has continued to be very high. In 2016-17, dependence on crude oil imports was as high as 87.2 per cent implying that *less than one-fifth of consumption of crude oil is being met by domestic production*. This heavy dependence on imports has considerably increased the pressure on the balance of payments.

At the same time, it has made India vulnerable to changes in international oil prices.

The other segment of the oil industry, that is refining, has also been developed considerably during the past six decades. The total refining capacity at the beginning of the First Plan was only 0.25 million metric tonnes per annum. As the indigenous production of crude oil increased and large imports had to be made for meeting the steadily rising consumption of petroleum products, refining capacity was expanded. The effective refining capacity at the end of 1980-81 was 31.8 million metric tonnes in terms of crude throughput. It rose to 69.1 million metric tonnes in March 1999 and further to 223.2 million metric tonnes as on April 1, 2015.

The net recoverable reserves of gas (free and associated) are presently placed at 1,119.55 billion cubic metres. The proportion of India's gas reserves to the world gas reserves is only 0.7 per cent. India depends considerably on imports of natural gas for meeting its domestic requirements. As far as domestic production of natural gas is concerned, it was 31.9 billion cubic metres in 2016-17 as against the target of 34.1 billion cubic metres.

The major reforms introduced in the oil and gas sector in recent years are:

- (1) allowing private sector participation in exploration and production of oil and natural gas,***
- (2) dismantling the administered pricing mechanism (APM), and***
- (3) allowing domestic companies to acquire international oil and gas reserves.***

The Government of India approved the New Exploration Licensing Policy (NELP)

in 1997 and it became effective in February 1999. Since then, licenses for exploration are being awarded only through a competitive bidding system and National Oil Companies are required to compete on an equal footing with other Indian and foreign companies to secure Petroleum Exploration Licenses (PELs). As far as APM (introduced in 1976) is concerned, it was abolished with effect from April 1, 2002 consequent upon the deregulation of the oil sector in India. Vide Gazette Notification dated April 28, 2002, the government notified that pricing of all petroleum products except PDS (Public Distribution Scheme) kerosene and domestic LPG, would be market determined. As far as acquiring international oil and gas reserves is concerned, the main organization undertaking this task is ONGC Videsh Limited (OVL), a wholly owned subsidiary of ONGC. OVL currently has participation in 30 projects in 15 countries. Another company working in this field is GAIL (India) Ltd., formerly known as Gas Authority of India Limited. GAIL has been pursuing business opportunities in South and South East Asia, West Asia and many other regions in the world in the areas of exploration and production, gas transmission, CNG and city gas distribution, LNG and petrochemicals. It has recently acquired its first shale gas asset in the USA through its wholly-owned US subsidiary GAIL Global (USA).

1.6.6 Atomic energy

India is now one of the few countries which have made considerable progress in the field of atomic energy. The country is self-reliant in this technology and thus it has established competence in carrying out activities over the entire nuclear fuel cycle.

The present installed electricity generation capacity in atomic energy sector is

4,560 MW. Total electricity generated in this sector was 37.9 billion KWh in 2016-17.

Atomic energy can be produced by using uranium or thorium. The deposits of uranium in India are limited. Presently, they are estimated at 34,300 tonnes. Uranium is found in Andhra Pradesh, Bihar and Rajasthan. India's thorium deposits have been estimated at 3,63,000 tonnes. Monazite is the source of thorium. It is found in Kerala, Karnataka and Bihar.

Self-reliance continues to be the thrust area in nuclear power development. However, the Nuclear Power Corporation does not presently have adequate financial strength to implement its programme. Moreover, it is a matter of concern that there have been inordinate delays in project implementation in this sector resulting in project overruns. It is also necessary to provide support facilities in terms of fuel fabrication and reprocessing.

1.7.7 Energy crisis

About four decades ago a major energy crisis developed in India. Since then, the government in this country has undertaken certain measures to tackle it, yet the problem remains and calls for serious attention. We shall now briefly discuss the important aspects of the energy crisis.

- 1. Oil prices and the inflationary pressure. *The energy crisis in India began with the hike of oil prices in 1973.*** In this year, the OPEC (Organisation of Petroleum Exporting Countries) had raised oil prices by more than four times. Since then, the oil prices have been increased several times by the OPEC. This has often contributed to the inflationary pressure which even otherwise has shown no signs of abating. Mineral oil is presently the major source of energy for transport,

industry and agriculture. It is also used as household fuel. Therefore, the policy of the OPEC to continuously raise the prices of petroleum products pushed the economies of oil importing countries into the dark era of cost-push inflation. Obviously India on account of its considerable dependence on the Gulf oil had virtually no escape from the crisis.

2. **Growing oil imports bill.** Beginning from 1973-74, India's oil imports bill has recorded a substantial increase. In 1973-74 India had imported oil and other petroleum products amounting to 1,100 crore. Since then oil bill has swollen rapidly. It rose to 5,264 crore in 1980-81, to 10,816 crore in 1990-91 and to a record level of 8,42,874 crore in 2014-15. Prior to the hike in the oil prices, oil imports were not a major burden as they were merely 12-13 per cent of India's exports. They rose to 44 per cent of the country's exports in 1973-74, and further to 44.4 per cent in 2014-15. This shows that ***a little less than half of total export earnings were used up just to meet oil import requirements in 2014-15*** (However, oil imports declined to 5,82,762 crore in 2016-17 which was 31.5 per cent of the country's export earnings in that year).
3. **Demand-supply imbalance in commercial energy.** There is huge demand-supply gap in commercial energy with the result that there is high dependence on imports. This heavy dependence on energy imports is a serious cause for concern and calls for an appropriate energy strategy in the future.

The energy strategy

In a country where proven reserves of oil are limited, the policy of a high degree of oil dependence could have disastrous effect on growth efforts. However, this was not realised by the Government of India until the oil prices were raised by

the OPEC. It was only when OPEC drastically increased the oil prices that some rethinking was done and a new energy strategy was evolved. The Planning Commission admitted the dangers of the policy of oil dependence in the Sixth Five Year Plan in these terms: "Apart from the heavy strain this will cast on the country's balance of payments, even the physical availability of oil in the international markets will pose a problem in the years to come. This means that if India's plans of economic growth are not to be hampered by inadequacies of energy supply, reduced dependence on imported oil has to be a key element in our development strategy." The new energy strategy emanates from this basic approach.

Energy Resources

In terms of domestic availability, coal is the most important source of commercial energy in India. The total reserves of coal are 301.6 billion tonnes. The recoverable oil reserves in the country are limited. The reserves of gas are about 1,120 billion cubic metres. Hydro-electric potential is estimated at 1,45,320 MW. However, only about one-fourth of this potential has been developed till date. According to *Economic Survey, 2010-11*, "the main reasons for slow development of hydro-power include difficult and inaccessible potential sites, difficulties in land acquisition, rehabilitation, environmental and forest-related issues, inter-state issues, geological surprises and contractual issues." Uranium and thorium are the two minerals used for generating nuclear energy. Assured uranium reserves in India are estimated to be about 34,300 tonnes of which a little less than half are economically exploitable. Thorium deposits are placed at about 3,63,000 tonnes.

From the inventory of commercial energy resources it appears as if the country has large resources. But when we compare India's per capita reserves

with those of other countries, we observe how unsatisfactory our position is. While India has reserves of 71 tonnes of coal per person, the USA has **13,747** tonnes and China 1,060 tonnes. Our per capita oil reserves are also small. We have a mere 0.81 tonnes per capita of oil reserves as against 16.32 tonnes in the USA and 2.86 tonnes in China.

Over the past several years, shortage of energy has been a major constraint on industrial development. Further, the skyrocketing prices of oil have swollen the import bill creating a difficult balance of payments position. Keeping these developments in view, a faster exploitation of domestic energy resources is required in the years ahead. It is now generally recognised that coal being the only fossil fuel in which this country is relatively better endowed, it is to be treated as the main source of commercial energy. The problems standing in the way of sustained increase in its production, though formidable, should be overcome. The exploratory effort to discover new resources will have to be intensified if the road transport system is not to be allowed to collapse under the pressure of soaring oil prices. Hydro-power is to be developed with a sense of urgency. The task is difficult indeed, as a substantial proportion of the potential exists in the sub-Himalayan regions of northern and northeastern India which are not easily accessible.

Energy Conservation and Management of Oil Demand

There is considerable wastage of energy in India due to inefficient transmission and distribution system of electricity and uneconomic unit size and obsolete technologies in some industries. This wastage can be reduced with careful energy planning. The decision makers now argue that "the cheapest form of alternative energy is energy saved". With this perspective, the Planning

Commission has advocated increasing the load density by demand management because it would reduce consumption of energy in its transmission and distribution. Apart from saving the energy in distribution process, all possibilities of conserving energy in industries are also required to be explored. In other words, in making the choice of techniques, energy efficiency should be adopted as one of the criteria. Scope for energy conservation exists in agriculture also, as studies of electric pumpsets indicate that, in a significantly large number of cases, mismatch between the pump and the motor exists.

Energy Strategy for the Future

Several expert bodies in the past, such as Energy Survey of India Committee (1965), the Fuel Policy Committee (1974), the Working Group on Energy Policy (1979), and the Advisory Board on Energy (1983-88) had stressed the need for long-term energy planning. The approach of the Eighth Plan was different. It gave importance to long-term integrated planning with emphasis on both efficient strategy of long run energy supply and energy end-use. The Planning Commission spelt out three aspects of this strategy. *First*, it should ensure gradual shift from non-renewable energy resources to renewable ones. **Second**, there has to be increasing emphasis on demand management and conservation of energy and efficient utilisation of energy resources. **Third**, a high priority has to be accorded to meeting the basic energy needs of the rural and the urban poor in the immediate future.

According to the Ninth Plan, energy challenges need to be tackled in such a way that social, economic, environmental and security problems are not aggravated. This would require adoption of measures that reduce energy

intensity of the economy. The Ninth Plan document mentioned the following measures to meet energy challenges in the long-term:

1. Demand management through greater conservation of energy, optimum fuel mix, and structural changes in the economy.
2. Shifting to less-energy-intensive modes of transport.
3. Moving away from depletable to inexhaustible energy resources.
4. Greater emphasis on exploration of hydroelectric power, particularly for meeting peak-demand.
5. Greater attention to research, development, transfer and use of energy-efficient technologies and practices in the supply as well as end-use sectors.

For a long period of time, implementation of an integrated policy remained an elusive goal. To alleviate this concern, the **Government of India drafted and released the Integrated Energy Policy in 2006, which provides a set of guidelines for envisioning the country's energy future.** The underlying rationale of the policy was the substitutability of one energy source with another for consumption and production purposes. The policy sought to address fragmentation that had crept into energy decision making with separate ministries dealing with power, petroleum and natural gas, coal, new and renewable sources, and atomic energy. It provided an overview of the energy supply and demand situation in the country and defined policy interventions in the areas of regulation, pricing, taxation and institutions. Since a comprehensive energy policy needs to cover the major energy consuming sectors of the economy, the Integrated Energy Policy lays emphasis on demand-side management."

New and renewable sources of energy

The renewable energy potential in the country has been assessed in the medium term at 8,96,602 MW, which includes the potential from solar (7,48,990 MW), wind (1,00,000 MW), small hydro (20,000 MW) and biomass (26,800 MW) power.¹² Apart from grid power requirement, renewable energy sources are also being used for distributed generation, lighting, pumping and motive power requirement in remote and inaccessible areas. India is graduating from Megawatts to Gigawatts in the generation of clean renewable energy. The target from various renewable energy sources has been increased to 175 GW by the year 2022. The major contributions are expected to be 100 GW from solar energy and 60 GW from wind energy.

Over the period April-December 2015, 3029.89 MW of grid-connected power generation capacity from renewable energy sources like solar and wind was added in the country, taking the cumulative generation capacity to over 38,820 MW. In addition, 74.68 MW equivalents decentralized/ distributed systems have also been installed in the country for providing distributed generation, lighting, pumping and motive power requirements.

Solar Energy. In field of solar energy, following measures have been announced:

- 1. Solar Rooftop.** The government has scaled up the budget from . 600 crore to .5,000 crore for implementation of grid-connected rooftop systems over a period of five years upto 2019-20 under the National Solar Mission.
- 2. Solar Parks.** In pursuance of the Solar Parks Scheme announced by the government in Union Budget 2014-15 for setting up of 25 solar parks

and ultra megasolar power projects with an aggregate capacity of 20,000 MW in the next five years in various States, 34 solar parks with capacity of about 22,000 MW have been sanctioned in 22 States.

- 3. Solar Projects under the NSM.** In February 2015, the government approved a scheme for setting up of 15,000 MW of grid-connected solar PV power projects under the NSM through NTPC Limited/NWN (NTPC VidyutVyapar Nigam) in three tranches by the year 2018-19.
- 4. Solar Pumps.** Against a target of installation of one lakh solar pumps for irrigation and drinking water, 1,21,524 solar pumps had been sanctioned as on December 31, 2015 and . 419.73 crore released to various agencies. By January 2016, 15,500 solar pumps had been installed.
- 5. Solar Cities.** Approval has been granted for 56 solar city projects against a target of 60 under the Development of Solar Cities Programme.
- 6. Surya Mitra Scheme.** The Surya Mitra Scheme was launched in May 2015 for creating 50,000 trained personnel within a period of five years (2015-16 to 2019-20).

Other Initiatives. In addition to steps to boost solar energy, other major initiatives taken by the government in 2015-16 included:

1. Announcement of the National Offshore Wind Energy Policy 2015 to exploit the vast 7,600 km coastline for development of offshore wind energy in the Indian Exclusive Economic Zone (EEZ).
2. Inclusion of renewable energy in the priority sector and bank loans upto 15 crore limit to borrowers' categories for purposes like solar-based power generators, biomass-based power generators, windmills, micro-hydel plants and for non-conventional energy-based public utilities like street

lighting systems, and remote village electrification and for individual households, upto . 10 lakh per borrower to be covered under priority sector lending norms.

3. Investments in renewable energy are on automatic route, i.e., automatic approval for upto 74 per cent foreign equity participation in a joint venture and 100 per cent foreign investment as equity is permissible with the approval of the Foreign Investment Promotion Board (FIPB).
4. Approval to the amendments in the National Tariff Policy 2005, *inter alia* adding promotion of renewable power as a key objective of the policy and enhancing Renewable Purchase Obligation (RPO) targets.

1.4.8 Conclusion

Infrastructure in India has still a very long way to go before we can call ourselves a developed nation. For the development of any economy "the need of the hour is to undertake a massive infrastructure expansion and decongestion programme coupled with upgradation of technology and judicious electrification of tracks alongwithenhancement of terminal capacity".

1.4.9 Short answer type questions

Write short notes on:

1. Coal
2. Sustainable Development
3. Energy Crisis
4. Renewable resources of energy

1.4.10 Long answer type questions

2. What do you mean by infrastructure? Explain all energy resources in India.
3. Why there is energy crisis? Explain the renewable energy resources.

Lesson No. 1.5

Infrastructure in India (Transport and Communication)**1.5.1 Introduction****1.5.2 Objectives of the lesson****1.5.3 Transport system****1.5.3.1 Railways****1.5.3.2 Roadways****1.5.3.3 Waterways****1.5.3.4 Airways****1.5.4 Communications****1.5.5 Conclusion****1.5.6 Short answer type questions****1.5.7 Long answer type questions****1.5.1 Introduction**

Infrastructure is the pre-requisite for economic development of any country. These infrastructural facilities include various economic and social overhead viz., Energy (Coal, Oil, Electricity), Irrigation, Transportation and Communication, Banking, Finance and Insurance, Science and Technology and other social overheads like education, health and hygiene. All these facilities jointly constitute the infrastructure of the country. Like other countries, the developmental process of India put much emphasis on the growth of infrastructure. *Development of infrastructure is a sine qua non of economic development.* For instance, development of agriculture depends, to a considerable extent, on the adequate expansion and development of irrigation

facilities. Industrial progress depends on the development of power and electricity generation, transport and communication. Obviously, *if proper attention is not paid to the development of infrastructure, it is likely to act as a severe constraint on the economic development process in the country.* Keeping this fact in view, the various plans focused attention on the expansion of infrastructure facilities.

1.5.2 Objectives of the lesson

In the present chapter, we propose to discuss the following constituents of infrastructure and their related problems and issues like transport system in India, railways, road transport, Water transport, Air transport and Communications.

1.5.3 Transport system in India

In modern world, transport along with energy is the basic infrastructural requirement for industrialisation and, accordingly, the developing countries have accorded it an important place in their programmes of economic development. Transport provides a vital link between production centres, distribution areas and the ultimate consumers. It also exercises a unifying and integrating influence upon the economy. Important means of transport are railways, roads, water transport (both inland and overseas) and air transport. Transport has recorded a significant growth over the years both in spread of network and in output of the system *With the Indian economy expected to grow at around 8 per cent per annum, the transport sector is expected to grow at 10 per cent per annum. The income elasticity of demand for transport currently is 1.25.*

1.5.3.1 Railways

The development and expansion of railways has revolutionised the transport system the world over. In India, the railways provide the principal mode of transportation for freight and passengers. The Indian Railways have been a good integrating force for more than 160 years (the first railway line was operationalised in 1853 between Bombay and Thane). The railways are the most convenient mode of transport for long distances and are most suitable for carrying heavy and bulky goods like iron ore, iron and steel, heavy machinery, minerals, etc. Railways carry raw materials from the mines and the quarries and other interior areas of the country to the industrial centres. They link up the various regions of the economy and increase the occupational mobility of people. In short, they play a crucial role in economic development. *In terms of route length, the Indian railway system is fourth largest in the world after US rail/roads and Russian and Chinese railways. As regards freight traffic, again it is fourth but substantially behind these three railway systems.* In passenger traffic, even though Japan carries more passengers, Indian railways is the highest in terms of passenger kilometres. The total route length of Indian railways is 66.7 thousand kms. of which 23.6 thousand kms. (i.e., 35.4 per cent) is electrified. During 2015-16, railways carried 8,107 million passengers and 1,101.5 million tonnes of revenue earning freight traffic. The railways operate services on three gauges — the broad gauge (1.676 metres), the metre gauge (1.00 metre), and the narrow gauge (0.762 metre and 0.610 metre). The broad gauge network is the largest operating system (55,956 kms.) in the country and accounts for the bulk of traffic, both freight and passenger.

Railways and the Plans

At the time of Independence, the railways were under severe strain and, therefore the First Plan was devoted mainly to the rehabilitation and modernisation of rolling stock and of fixed assets. On account of the heavy replacement demands, the need for expansion could not be fully met in the First Plan. The Second Plan also had to make a substantial provision for rehabilitation of aged assets. The emphasis in this plan, however, shifted to the programmes required to augment line capacity on different sections of the railways and to the procurement of additional rolling stock to meet the growing demand for railway transport arising from the increased production in the agricultural and industrial sectors of the economy. The Third Plan envisaged a rapid expansion of railways due to their importance for industrial programmes (particularly, the carrying of heavy goods like coal, iron ore and other materials for the steel plants, etc.). It was also recognised that in view of the difficulties of coping with anticipated increase in traffic with steam traction in the regions where the coal fields and the new steel plants are situated, electrification and dieselisation had become an operational necessity. Provision was accordingly made for the electrification of a number of sections on the Eastern, South-eastern, Central and Southern Railways.

The basic objective of the Fourth Plan for the railways was to provide in full for the increase in traffic expected, to modernise the railway equipment and practices within the limits of the funds available and to convert 1,676 kms. of metre gauge to broad gauge in areas of rapid economic development and high traffic potential. The expenditure on rolling stock, track renewals and line capacity works constituted about 70 per cent of the expenditure on railways in the Fourth Plan. The Fifth Plan recognised the important role that railways had to perform in developing the transportation systems in the economy and

provided for an outlay of 2,350 crore of which around 68 per cent was to be for rolling stock, track renewals and line capacity works.

The Sixth Plan kept an outlay of 5,100 crore for railways of which 2,100 crore was to be for rolling stock and 500 crore for track renewals. The actual expenditure in the Sixth Plan was around 6,573 crore. The railways recorded an excellent performance during the Seventh Plan in terms of additional transport effort, rehabilitation of the system, financial performance, better productivity, technological upgradation, modernisation and industrial relations. The main thrust in the Eighth Plan for railways was on capacity generation. Some other aspects which received special attention during the Eighth Plan were rehabilitation, modernisation, energy conservation, manpower planning, financial viability, safety and customer satisfaction through better quality of services.

During the planning period covered by the first Eight Five Year Plans (the period from 1950-51 to 1996-97) the passenger output measured in terms of non-suburban passenger kilometres increased by 5.4 times and the freight transport measured in terms of net tonne kilometre increased by 6.3 times. However, the share of railways in total traffic steadily declined over these years. It came down from 89 per cent in 1951 to 40 per cent in 1995 in respect of freight traffic and from 68 per cent to 20 per cent in respect of passenger traffic.

The main thrust of the Ninth Plan was on strengthening the capacity of the Indian railways as the prime carrier of long distance bulk freight and passenger traffic. To this end, the railways are concentrating on

electrification of dense corridors, improvement in operations, optimal assets utilisation, increasing container facility and raising manpower productivity. There was a strategic shift in the objectives of railways under the Tenth Plan so that it regains some of the business it has lost to other modes of transport over the past few decades. With this purpose in view, the thrust was on modernisation and technological upgradation of the railway system. It was also decided to make Indian railways more user-friendly and market-savvy organisation.

Problems and Issues in Railway Development

The main problems and issues in railway development are as follows:

1. The biggest constraint that railways face today is of inadequate network capacity and infrastructure. In fact, capacity creation on railways over the years has not kept pace with the transport output. In this context, the *White Paper* released by the Ministry of Railways alongwith the Railway Budget for 2015-16 points out that ***whereas over the period 1950-51 to 2013-14, route-kilometres increased by just 23 per cent and double and multiple route length by 289 per cent, the freight and passenger output went up by more than 14 and 17 times respectively.*** This clearly **shows** that additional infrastructure has not kept pace with **the** increase in traffic output. As a result, there is large scale congestion of the system.
2. Freight earnings account for over 67 per cent of the **total** traffic earnings of Indian railways. Freight traffic rate on Indian railways is among the highest in the world (it is four times as compared with the US rail/roads, more than **three** times as compared with Russian railways and more than twice as compared with Chinese railways). One of the **main** reasons for this is that passenger fares are very low in India as compared with

most of the foreign railways with the result that there are substantial losses in passenger operations *High freight rates result in high prices of transported goods creating inflationary conditions in the economy.*

3. There is a massively skewed traffic pattern on the railways with heavy traffic moving on the golden quadrilateral and its diagonals, connecting the four metropolitan cities of Delhi, Kolkata, Mumbai and Chennai. Further, 161 out of total 247 sections, i.e., *65 per cent of the sections are running at 100 per cent or above line capacity of high density network routes. Freight transit time on these high congested routes is severely affected. A number of mineral and port routes are also severely congested.*
4. *There is a common corridor for both freight and passenger traffic.* With freight trains and slow moving passenger trains on the same corridor, it is extremely difficult to run fast passenger services. Further, with the emphasis on passenger traffic, passenger trains take precedence over running of freight trains. On some of the major trunk routes, introduction of new passenger trains directly affects freight train movement. It is no surprise, therefore, that the average speed of freight trains is very low.
5. There is a large shelf of pending projects which is estimated at. 4,91,510 crore on the basis of originally estimated costs. Projects have been languishing for years on account of absence of assured funding. Moreover, there is a constant pressure to undertake new projects (mostly in the form of new lines) by various sections of the society. The severe scarcity of funds against the requirements has led to the spreading of resources thinly over a large number of projects, and all these projects are delayed due to shortage and uncertainty in the availability of funds, leading inevitably to time and cost over-runs.

6. Indian railways has suffered from chronic and significant under-investment as a result of which the network expansion and modernization has not happened at the requisite pace leading to an erosion of the share in national freight and passenger traffic. Due to under-investment, there has been severe congestion on the network and has resulted in the inability of the system to accommodate more trains and increase the speed of trains.
7. The market share of rail transport has fallen drastically over the years with the road sector being the biggest gainer. For improving the market share of the railways, a focused strategy aimed at providing better services at competitive tariffs is required. In addition, it is also necessary to provide faster transit and efficient handling at terminals. As far as the passenger segment is concerned, it is facing increasing competition from better roads and low cost, no-frills airlines. Accordingly, railways need to provide an adequate number of faster intercity and medium distance services to face the competition and win back business.
8. In a situation of limited resources, significant savings in investment and in cost of operations (along with improvement in quality of services), can be realised by inducting modern technology. ***The existing technology of both electric and diesel locomotives is considerably old.*** There is a need for introduction of higher horsepower electric and diesel locomotives, which are also more fuel-efficient. In view of the rapid growth of technology, it is necessary for us to build a technology base of our own, capable of not only selecting and assimilating the latest and most appropriate technologies, but also of developing them further, continually, so as to achieve near self-sufficiency in the technological know-how.

1.5.3.2 Road transport

Roads are generally classified into the following categories:

- (i) **National highways** — These roads are the primary roads of the country and connect large cities and big industrial centres. Their development and maintenance is the responsibility of the Central Government. Initially our road system developed around four main national highways connecting Khyber with Kolkata through Delhi; Kolkata with Chennai; Chennai with Mumbai; and Mumbai with Delhi;
- (ii) **State highways** — *These roads link all the important centres of industry, trade and commerce of the State and National Highways;*
- (iii) **District roads** — *These roads connect different parts of the district, important industrial centres and market centres and usually lead to local railway station; and*
- (iv) **Rural roads** — *These roads are found in villages and are usually of two types — pucca (or metalled) and kutcha (or non-metalled).*

Road Development in India

India has the second largest road network in the world, aggregating to about 54.8 lakh kilometres at present. As on March 31, 2017, out of the total road network, the length of National Highways comprises 1,14,158 kms. with 1,61,487 kms. of State Highways and 52,07,044 kms. of other roads. However, this network is not adequate for speedy and efficient transportation. This would be clear from the fact that while the National Highways carry about 40 per cent of the goods and passenger traffic, they constitute only about 2 per cent of the total road network. Presently, 60 per cent of the freight movement and 87.4 per cent of the passenger movement depends on roads.

Three important initiatives in the road sector were undertaken in recent years: The National Highway Development Project (NHDP), Pradhan Mantri Bharat Jodo Pariyojana (PMBJP) and Pradhan Mantri Gram Sadak Yojana (PMGSY). **NHDP deals with building high quality highways. The PMBJP deals with linking up major cities to the NHDP highways. The PMGSY addresses rural roads.**

The NHDP is the largest highway project ever undertaken by the country and is being implemented by the National Highway Authority of India (NHAI). It consists of the following components: -

NHDP Phase I and II: The Phases I and II of NHDP envisage 4/6-laning of about 14,000 kms. of National Highways at an estimated cost of about 65,000 crore at 2004 prices. These two phases comprise: (i) Golden Quadrilateral (GQ), i.e., National Highways connecting four metropolitan cities — Delhi, Mumbai, Chennai and Kolkata having an aggregate length of 5,846 kms; (ii) North-South and East-West Corridor (NS-EW) which comprises 4-laning of 7,142 kms. of National Highways connecting North-South corridor from Srinagar to Kanyakumari with Cochin-Salem spur and East-West corridor from Silchar to Porbandar; (iii) 380 kms. length of National Highways are proposed to be upgraded to 4-lane standards for providing connectivity to 12 major ports of the country to NHDP; and (iv) Upgradation of 965 kms. of other important National Highways.

NHDP Phase III: NHDP Phase IV involves 4/6-laning of 12,109 kms. of NH having high-density corridor connecting State capitals, important tourist places, economically important areas, etc., on PPP (public-private partnership) basis at an estimated cost of 80,626 crore.

NHDP Phase IV: Phase IV of NHDP involves upgradation/strengthening of 20,000 kms. of single/ intermediate/two lane National Highways to two lanes with paved shoulders on BOT (Toll) and BOT (Annuity) basis.

NHDP Phase V: Phase V of NHDP involves 6-laning of 6,500 kms. of National Highways comprising 5,700 kms. of GQ and balance 800 kms. of other sections of national highways at a cost of. 41,210 crore.

NHDP Phase VI: NHDP Phase VI involves construction of 1,000 kms. of expressways with full access control on new alignments at a cost of. 16,680 crore.

NHDP Phase VII: Phase VII of NHDP involves construction of 700 kms. of ring roads of major towns and bypasses and construction of other standalone structures Rich as flyovers, elevated roads, tunnels, underpasses, ^rade separated interchanges, etc., on National Highways at a cost of. 16,680 crore.

The government has proposed 'Bharatmala Programme' with a view to develop the road connectivity to border areas, development of coastal roads including road connectivity for non-major ports, improvement in the efficiency of national corridors (the National Highways developed under the various phases of NHDP), development of economic corridors/feeder routes, removal of choke and congestion points, construction of ring roads, logistics parks etc. The government has initiated a separate programme 'SetuBharatam' in 2016 for the construction, rehabilitation and widening of 1,500 major bridges and 208 Railway Over Bridges (ROBs)/Railway Under Bridges (RUBs) National Highways.

A Critical Appraisal

The road sector in India is facing a number of constraints like delays in land

acquisition and removal of Structures; significant increase in land acquisition cost; lack of equity with developers and poor performance of some contractors; too many bottlenecks and checkpoints on National Highways which could adversely impact benefits GST; higher cost of financing and shortfall in funds for maintenance; law and order problem in some States, etc.

As far as the implementation of NHDP is concerned, proof has been received from across the country pointing to large-scale rigging and corruption. Essentially, there are fair separate areas in which manipulation is taking place resulting in hundreds of crore of losses to NHAI and the government:

1. To start with, many projects are being converted from the build-operate-transfer (BOT) toll schemes to the BOT-annuity schemes. In toll projects, the builder makes his money from toll collected over the 10-15 years period of his concession. In annuity projects, the government simply gives half-yearly fixed payments to the builder for the period of his concession — which could stretch to 15 or even more years. Annuity projects, therefore, carry no risk for the builder and are particularly attractive to the bidders. However, such projects commit the NHAI (and, hence the government) to payout large amounts of money regularly for the entire period of the concession. The overall financial burden could be very high if too many such contracts are given out. It has also been found that many annuity projects are being padded up to give a more than reasonable return to the bidders.
2. The NHAI is giving large sums of money to the builders of winning projects to help them complete the roads. The Viability Gap Funding (VGF) — or the amount that the NHAI gives to the concessions as its contribution for building the road — is also ballooning beyond all rationale.
3. Projects are being over-engineered to increase the total project cost

resulting in a colossal waste of funds and great gains for winning bidders. For instance, where traffic projections justify a two-lane roads, they are being converted to four-or six-lane roads to make them more lucrative to contractors. Over-engineering is also taking place in another way — far more flyovers, underpasses and side lanes are being built into the projects than may be justified.

4. Perhaps the most worrying of all the allegations is that a cartel of sorts is operating. Who will win certain contracts is decided in advance. Many other bidders are actively discouraged from bidding for those contracts. As a result of cartelisation, in many cases only one or two bids are received and they are rather close to each other indicating of collusion (and arbitrarily hiked costs).

The Problem of Rail/Road Coordination

Rail and road transport are complementary to each other. Taken together, they form the principal means of connecting all parts of the country with one another. The road transport provides an important link between farmers in the villages and the local *mandisor* the nearest railway on. The railways, on the other hand, provide connections between the areas of production and the areas of consumption separated from each other by long distances.

Since railways cannot reach every nook and corner of the country, they need the assistance of road transport. Trucks and other means of road transport must collect goods from production centres and bring them to the railway station. At the railway station, goods would be loaded on trains and sent to far-flung places. Once they reach their destination, they will again need the assistance of road transport to deliver them to the distribution centres. In a

similar way, one cannot think of road transport in isolation. Heavy machinery, iron and steel, cement, coal and other minerals, etc. which are heavy and bulky goods cannot be transported by trucks. This requires assistance of railways.

This shows that *railways and road transport are complementary to each other*. However, they have tended to become competitive everywhere and railways have been the loser. As stated earlier, this is on account of the fact that road transport has certain important advantages over rail transport. For instance, road transport provides door-to-door service. Therefore, loading and unloading charges are comparatively low and possibilities of theft are reduced. In addition, goods reach their destination faster. The operational and maintenance cost of road transport is also much lower as compared to rail transport. In the case of road transport there is complete flexibility in adjusting route and timetable according to the needs of individual customers, whereas railways follow a laid down route and operate according to a fixed timetable. Moreover, the railways are subject to many legal restrictions and regulations in the overall interests of public safety. The formalities involved in booking and release of goods are numerous causing considerable delays. What is more, transporters develop personal relations with regular senders of goods. This enables them to provide certain *personalised services* which no railway system can provide.

On account of the above reasons, railways have lost ground to road transport over the years and, as stated earlier, the share of road transport in freight traffic as well as passenger traffic has increased steadily. However, now once again, rail transport has been attracting increasing attention. This is due to the reason that constantly increasing prices of petroleum and petroleum

products are imposing a heavy burden on the balance of payments of the country. A large amount of foreign exchange is being spent on the import of petroleum and petroleum products. Moreover, the consistently increasing number of vehicles on roads is leading to heavy congestion on roads leading to considerable wastage of time in traffic jams on the one hand, and increasing air and noise pollution on the other hand.

In conclusion, it can be said that both rail transport and road transport are important in themselves and play a crucial role in the country's development. In fact, the entire transport system of the country should be viewed in an integrated way and so developed that overall transport costs are minimised.

1.5.3.3 Water transport

Water transport can be broadly divided into two groups — (1) inland water transport, and (2) shipping.

Inland Water Transport

India has got about 14,500 kms. of navigable waterways. Inland water transport includes natural modes as navigable rivers and backwaters and artificial modes such as canals. Inland Waterways Authority of India (IWAI) was constituted in 1986 for the development and regulation of inland waterways for shipping and navigation. However, most waterways suffer from navigational inadequacies such as shallow waters, narrow width, siltation and bank erosion. Consequently, its operations are currently restricted to about 5,200 kms. of major rivers and 485 kms. of canals suitable for mechanised craft operations. Today, *there are five waterways that have been declared as National Waterways (NWs), namely Ganga from Haldia to Allahabad (1,620*

kms.); Brahmaputra from Dhubri to Sadiya (891 kms.); West Coast Canal from Kottapuram to Kollam, including Chempakara and Udyogamandal canals (205 kms.); Kakinada-Puducherry stretch of canal and Kalurelly Tank, stretches of river Godavari and Krishna (1,995 kms.); and TalcherDhamra stretch of river Brahmami, GeonkhaliCharbatia stretch of East Coast Canal, Charbatia-Dhamrastretch of Matai river alongwith Mahanadi delta river system (623 kms).

Development of inland water transport commenced from the Second Five Year Plan and up to the end of Fifth Plan, the total expenditure on this sector was 34 crore. It was only in the Sixth Plan that this sector was given priority and specific schemes of inter-state and national importance for development of inland water transport were taken up. The Seventh Plan was an important landmark in the development of inland water transport. The expenditure on this sector in the Plan (at 131.85 crore) was more than the expenditure incurred right up to the end of the Sixth Plan. Three objectives were laid down in the Eighth Plan forthe development of inland water transport:

- (i) development of inland water transport in the regions where it enjoys natural advantage;
- (ii) improvement in the productivity of assets through modernisation of vessels and country crafts to suit local conditions; and
- (iii) building up of trained and skilled manpower for inland water transport operations.

In the Ninth Plan efforts were made to make inland water transport as an acceptable mode of transportation by reduction in cost and time of transportation and enhancement of safety and reliability of the cargo. The

Inland Water Transport Policy approved by the government in January 2001 aimed at giving a boost to the development of this mode of transport. The policy included a number of incentives to encourage private sector participation in inland water transport. The focus of the Eleventh and Twelfth Plans was on putting requisite infrastructure on the existing waterways to make them fully functional.

To promote inland water transport, several steps have been taken in recent times. *The National Waterways Act, 2016 has been enacted and enforced to provide for the declaration of 106 additional inland waterways to be National Waterways in addition to the already existing five NWs.* The '*Jal Marg Vikas Project*' (on NW-I: River Ganga), a large integrated IWT Project, has been launched with the purpose of ensuring navigation of 1500 to 2000 tonne vessels by developing infrastructure and a fairway of 2.2 to 3 metres depth between Varanasi and Haldia covering a distance of 1,380 kms at an estimated cost of. 5,369crore. The project is being implemented by IWAI and is to be completed in six years, with the technical and investment support of World Bank.

Shipping

Shipping is divided into two categories, coastal shipping, and overseas shipping. As on April 30, 2017, India had a fleet strength of 1,323 ships with deadweight tonnage (DWT) of 17.50 million (11.70 million Gross Tonnage) with Shipping Corporation of India (SCI) having the largest share of 34 per cent. Of this, around 410 ships of 15.79 million DWT (10.17 million Gross Tonnage) cater to India's overseas trade and the rest to coastal trade.

Coastal Shipping. India has a long coastline of 7,517 kms., a number of ports (13 major and 200 non-major ports) and a vast hinterland. Therefore, coastal shipping holds a great promise more so because it is the most energy efficient and cheapest mode of transport for carriage of bulky goods like iron and steel, iron ore, coal, timber, etc., over long distances. However, despite this fact (and despite the fact that coastal shipping was reserved exclusively for Indian ships after Independence), there was a sharp decline in coastal shipping operations during the 1960s and 1970s. *The main factors affecting the growth of coastal shipping adversely were high transportation costs especially for movement other than those between a pair of water front locations, port delays, poor turnaround time of coastal ships on account of overaged vessels, and lack of mechanical handling facilities, etc.* The coastal fleet is ageing fast. Also, there is imbalance in coastal traffic movement as traffic is not equally available in both directions. This makes it necessary for coastal ships to sail in ballast, at times on return journey. Moreover, slow handling of the cargo at port and undue port delays inflict heavy losses on shipping companies.

Overseas Shipping. Because of the importance of overseas shipping in international trade, considerable attention has been paid to increase the shipping tonnage in the planning period. As a result, the share of Indian shipping in the transportation of India's overseas trade has slowly and consistently increased in the planning period. Presently, almost 95 per cent of the country's trade volume (68 per cent in terms of value) is moved by sea.

During the Tenth Plan, an outlay of 7,754 crore was provided for the shipping sector while expenditure was only 2,992 crore (*i.e.*, only 38.6 per cent of the total outlay). An outlay of 15,026 crore was kept for the shipping sector in

the Eleventh Plan while actual expenditure was 9,788 crore (*i.e.*, 65 per cent of outlay). The outlay for the shipping sector in the Twelfth Plan was kept at 28,950 crore.

Ports. At present, there are 13 major ports and 200 non-major ports along India's coastline. Because of their importance for coastal and overseas shipping, special efforts have been made in the Plans for the development and modernisation of existing ports and establishment of new ports. The National Harbour Board was set up in 1950 to advise the Central and State Governments on the management and development of ports, particularly minor ports. In March 1976, the government set up the Dredging Corporation of India to undertake capital and maintenance dredging at the ports in an integrated manner.

Major ports are the direct responsibility of the Central Government while non-major ports are managed and administered by the respective State Governments. The cargo traffic of Indian ports increased by 5.9 per cent to 1,135.63 million tonnes in 2016-17, of which the traffic at major ports was 647.63 million tonnes and approximately 448 million tonnes at non-major ports.

Some of the challenges being currently faced by the Indian shipping sector are as follows:

- (i) the average turnaround time at Indian ports is much greater *vis-a-vis* ports of many other countries (according to Twelfth Plan. 57 per cent of turnaround time of ships at Indian ports is caused by delays due to port inefficiency). High turnaround time undermines the competitiveness of Indian ports;

- (ii) since ports are not adequately linked to hinterland, the evacuation of cargo is slow, leading to congestion;
- (iii) there has been a sharp decline in the share of Indian ships in the carriage of India's overseas trade from about 40 per cent in the late 1980s to only 7 per cent in 2015-16; and
- (iv) as pointed out by *Economic Survey 2016-17*, the existing Indian fleet is ageing, with the average age increasing from 15 years in 1999 to 19.3 years as on January 1, 2017 (in fact, 45 per cent of the fleet is over 20 years old).

1.5.3.4 Air transport

Air transport is the most modern, the quickest and the latest addition to the modes of transport. Because of the speed with which aeroplanes can fly, travel by air is becoming increasingly popular. As far as the world trade is concerned, it is still dominated by sea transport because air transport is very expensive and is also unsuitable for carrying heavy, bulky goods. However, transportation of high value light goods and perishable goods is increasingly being done by air transport.

In India, a beginning in air transport was made in 1920 when the government first decided to prepare air routes between Mumbai and Kolkata and Kolkata and Rangoon. The civil aviation works were actually started in 1924-25, but progress was slow until the Second World War. Between 1947 and the commencement of the First Plan, about . 6.6 crore were spent on these works.

During the period of the First Plan itself, it was realised that conditions in the air transport industry were such that, if it was to remain privately

managed, substantial financial assistance would be required from the government for the replacement of the fleet which had become long overdue. The government, therefore, decided that it was better to nationalise air transport. Accordingly, ***the Air Corporation Act was passed in 1953. In accordance with the Act, two State Corporations, namely, the Air India International and the Indian Airlines were established*** The Air India International was intended to operate a long distance international system while the Indian Airlines Corporation was to operate the internal scheduled services and the air services to the neighbouring countries.

A significant step was the setting up of the International Airports Authority of India (IAAI) in 1972, for the management and development of the four international airports in Mumbai, Kolkata, Delhi and Chennai. The Fifth Plan kept an outlay of 391.50 crore for the development of air transport which was raised to 931 crore in the Sixth Plan. It was in January 1981 that the third airline Vayudoot was set up to connect inaccessible areas of the country which are not covered by Indian Airlines and those areas of the country which are important centres of trade, commerce and are important from the point of view of tourism. In October 1985 the government set up the Pawan Hans Ltd., to provide helicopter-based air transport services to meet the requirement of the petroleum sector, to operate services in inaccessible areas and hilly terrains, to operate tourist charters and to provide intra-city transport service.

During the Tenth Plan, an outlay of 12,928 crore was provided to the Ministry of Civil Aviation out of which 7,792 crore was spent. There was a massive expansion in air transport services during this Plan due to opening

up of domestic skies to private carriers. Important developments in the airline and airport sector included:

- (1) modernisation and restructuring of Delhi and Mumbai airports launched through joint venture companies;
- (2) development of greenfield airports at Bangalore and Hyderabad on a Build-Own-Operate-Transfer basis with PPP (public-private partnership);
- (3) approval of modernisation of 35 non-metro airports and 13 other airports to world-class standards in phases;
- (4) liberalisation of FDI (foreign direct investment) limit up to 100 per cent through automatic route for setting up greenfield airports;
- (5) acquisition of modern and technologically advanced aircraft for Air India Ltd., Air India Charters Ltd., and Indian Airlines Limited;
- (6) liberalisation of bilateral air services agreement in line with the contemporary developments in international civil aviation sector;
- (7) adoption of a limited Open Sky Policy in international travel to meet the traffic demand during peak season; and
- (8) adoption of trade facilitation measures in custom procedures to facilitate speedy clearance of air cargo.

The outlay for the civil aviation sector in the Eleventh Plan was kept at 49,267 crore while actual expenditure was 44,124 crore. Thus, there was a shortfall of 5,143 crore (10.44 per cent) in utilisation of the approved outlay. The Twelfth Plan aimed to propel India among the top five civil aviation markets in the world by providing access to safe, secure and affordable air services to everyone through an appropriate regulatory framework and by developing world-class infrastructure facilities. To meet the traffic growth projections in the Twelfth

Plan, an investment of 67,500 crore was estimated (of which the share of the private sector investment was placed at 50,000 crore).

Air India and Indian Airlines operating in the international sector and domestic sector respectively since 1953 are born in the public sector. They enjoyed monopoly status for a considerable period of time. However, in recent years, a large number of private sector companies have entered the civil aviation sector as the government has ended the monopoly of Air India and Indian Airlines by repealing the Air Corporation Act, 1953. *Air India and Indian Airlines were merged on August 27, 2007 to form National Aviation Company of India Ltd. (NACIL).*

The 5/20 Rule. The 5/20 rule mandates that for an airline to carry out international operations, it needs to have 5 years of domestic flying operations and would have to deploy 20 aircraft or 20 per cent of total fleet of aircraft, whichever is higher, towards domestic operations. As a result of this rule, only three private airlines had been eligible to fly abroad - Jet Airways, Spice Jet and Indigo. In 2016, the Government of India relaxed this rule to 0/20. This relaxation is aimed to enable more private players to take to international flying operations.

UDAN. UDAN (UdeDeshkaAamNagrik), a key element of National Aviation Policy 2016, is an innovative Regional Connectivity Scheme to supplement air traffic growth in regional aviation through a market based mechanism. UDAN provides a few seats at affordable passenger fares of 2,500 for an hour-long flight. Under UDAN, 70 airports and 128 routes are connected, and over 100 more unserved airports are to be connected in the next rounds of

bidding of routes.

1.5.4 Communications

Communications means the imparting or transmission of information.

The difference between transport and communications is that while the former implies the conveyance of goods, the latter implies the conveyance of information. The conveyance of information is very necessary for the development of industries, commerce and trade in the country. There is a close interlink between communications and transport since all tangible communications have to be sent by transport (only intangible communications can be sent by wireless). Improvements in communications help to speed up transport while improvements in transport help to speed communications. ***The most important means of communications are the postal services, telephone services, teleprinters, radio and television, internet, etc.***

Postal Services

Modern Postal System in India dates back to 1837 when postal services were thrown open to the public. However, it was with the attainment of Independence that the postal services came to be recognised as an essential infrastructure of development. Due to expansion of postal network in successive Five Year Plans, the number of post offices has increased from only 23,344 at the time of Independence to 1,54,856 at present. Now, on an average, a post office serves 7,811 persons and covers an area of 21.25 sq. kms. The Indian postal network is the largest in the world.

From the point of view of communications, post offices provide inland postal communication services. The three means normally used for this purpose are

— (a) post card, (b) inland letters (aerogrammes in the case of overseas), and (c) envelopes. Important letters and articles can be sent by registered post. Goods less than a prescribed weight can also be sent through parcels (registered or unregistered). The government adopted a scientifically designed six digits postal index number code, popularly known as PIN, in 1972. Quick Mail Services (QMS) was introduced in 1975. This service covers all State capitals, headquarters of all union territories and important commercial towns. Under the Speed Post Service introduced on August 1, 1986, articles are delivered under definite timeframe, with money back guarantee for any service defect. To provide better service to the customers, mechanisation and computerisation of postal operations is being progressively introduced.

Telecommunications

Though rapid progress of the postal services over the last few decades has led to a considerable increase in communications, the most important factor accounting for increased communications has been the development of telecommunications. The telecommunications sector has witnessed revolutionary changes in recent years and *the Indian telecom network is now the second largest in the world after China*. From only 76.54 million telephone subscribers in 2004, the number increased to 1,195 million as at end-March 2017. This increase has been entirely due to the spectacular increase in wireless connections or mobile connections. The number of these connections rose from 35.62 million in March 2004 to as high as 1,170.6 million as at end-March 2017. Teledensity, an important indicator of telecom penetration, increased from 7.04 per cent in March 2004 to 93.0 per cent at the end of March 2017. Fully automatic International Subscriber Dialling (ISD) service is available to almost all the countries. In the field of International

Communication, tremendous progress has been made by the use of Satellite Communication and Submarine links.

*A regulatory authority in the telecom sector known as Telecom Regulatory Authority of India (TRAI) was set up on **February 20, 1997**. It has been set up with a view to discharge regulatory functions, thereby providing a level playing field in the telecom sector. **In 1999, the government announced a New Telecom Policy (NTP, 1999)**. In terms of this policy, the government opened the National Long Distance Service to private operators without any restriction on the number of operators with effect from August 13, 2000. Companies registered in India are being licensed to plan, install, operate and maintain the basic services.*

The Twelfth Plan programmes for the telecom sector were guided by the National Telecom Policy (NTP) 2012.

The thrust of NTP-2012 was on raising the competitiveness of Indian telecom sector, to make it a world leader, and at the same time, making available a variety of services on a single platform utilising the technological advancements taking place in the sector. **The mobile industry in India currently contributes 6.5 per cent (\$ 140 billion) to the country's GDP and employs over 4 million people directly and indirectly.**

Digital India. The government has placed emphasis on the growth of the telecom sector in the country for the success of Digital India campaign. It has brought reforms in spectrum management through the process like spectrum sharing, spectrum trading, spectrum harmonization and most importantly, spectrum auction. The government has expressed its commitment to extend the

reach of the mobile network to all over India especially the remote and rural villages in order to convert India into a digital economy and knowledge society. For the deeper digital penetration in rural areas, a '**Bharat Net**' programme has been launched in a mission mode to link each of the 2.5 lakh Gram Panchayats through Broadband optical fibre network. On its completion, Bharat Net would facilitate Broadband connectivity (with a 100 Mbps of bandwidth) for over 600 million rural citizens of the country. This is the largest rural connectivity project of its kind in the world, and is the first pillar of Digital India programme. It will facilitate the delivery of various e-Services and applications including e-health, e-education, e-governance and e-commerce in the future.

1.5.5 Conclusion

There are still broad disconnects between the rural and the urban sectors. The roads and other means of contact between these two sectors are still not very developed. We require well-paved roads connecting the remote areas of the country with the urban states so that more and more facilities are made available to the rural Indian population. A lot of artisans and farmers still work in the remote places of the country and are unable to sell their products in the mainland due to lack of proper infrastructure. It can be said that both rail transport and road transport are important in themselves and play a crucial role in the country's development. In fact, the entire transport system of the country should be viewed in an integrated way and so developed that overall transport costs are minimized.

1.5.6 Short answer type questions

Write short notes on:

5. Indian transport system
6. Indian Railways
7. Roadways
8. Waterways

1.5.7 Long answer type questions

- 2 Explain the development of Indian transport system
- 3 Explain the problems of railways and roadways transport.

Lesson No. 1.6

URBANISATION IN INDIA**1.6.1 Introduction****1.6.2 Objectives of Lesson****1.6.3 Definition****1.6.4 Urbanisation Trends in India****1.6.5 Causes of urbanisation****1.6.6 Migration of rural population****1.6.7 Urban Challenges****1.6.8 Consequences of urbanization****1.6.9 Role of urbanization in economic development****1.6.10 Conclusion****1.6.11 Short answer type questions****1.6.12 Long answer type questions****1.6.1 Introduction**

Urbanisation is a part of the development process. In backward stagnant societies, the process of urbanisation is rather slow, because cities fail to offer employment opportunities to people living in the countryside. Those who migrate to cities in such societies are in fact, pushed out of villages due to economic and social pressures; they are rarely pulled by the so-called attractions of the urban life. In contrast to stagnant backward societies, urbanisation process is fast in rapidly growing economies where newly established industries and ancillary activities continuously provide jobs to

people who wish to migrate to cities. The economic pull of cities in this phase of development becomes particularly strong if industrial growth is fast, and in spite of high capital intensity, industries offer jobs in increasingly large number. The process of urbanisation slows down only when the proportion of urban population TO total population in a country becomes very high.

1.6.2 Objectives of lesson

In this lesson we study about urbanization in India its nature and development

1.6.3 Definition of Urban Area

Since the 1971 Census, urban area has been defined in India as follows:

1. All places with a municipality, corporation, cantonment board or notified towns area committee, etc.
2. All other places which satisfy the following criteria:
 - (i) minimum population of 5,000
 - (ii) at least 75 per cent of male working population engaged in non-agricultural pursuits; and
 - (iii) density of population of at least 400 persons per square kilometre.

Urban settlements under the first category are known as statutory towns while urban settlements under the second category are known as census towns. Cities and Urban Agglomerations. The Indian Census classifies the urban settlements into the following six size classes.

Table 6.1.1: Population and Class Size

Population	Size Class
1,00,000 and above	I
50,000 - 99,999	II
20,000 - 49,999	III
10,000 - 19,999	IV
5,000 - 9,999	V
Less than 5,000	VI

Settlements with population of 1,00,000 and above are termed as 'cities' in contrast to 'towns' that have population below 1,00,000 persons. Towns in Classes II and III are regarded as 'medium towns' while towns in Classes IV-VI are termed as 'small towns'. Many medium towns (especially those in Class II) shift to Class I category in every Census as a result of natural increase in their population and migration.

The 1951 Census introduced the concept of town groups. A town group was defined as "a group of towns which adjoined one another so closely as to form a single inhabited urban locality". This was done to distinguish a group of towns from an isolated town so that areas of conglomerate growth can be marked off for purposes of better planning and development.

The 1971 Census introduced the concept of urban agglomeration. Urban agglomeration (UA) would be constituted in the following situations:

- (a) a city with a continuous outgrowth (the part of outgrowth being outside statutory limits but falling within the boundaries of the adjoining village

or villages);

- (b) one town with a similar outgrowth or two or more adjoining towns with their outgrowths as in (a); and
- (c) a city and one or more adjoining towns with their outgrowths all of which form a continuous spread.

1.6.4 Urbanisation Trends in India

Before we discuss the trends of urbanisation in India, it is necessary to distinguish between 'urban growth' and 'urbanisation'. Technically speaking, 'urban growth' denotes the net population increase of towns and cities while 'urbanisation' refers to the proportionate increase of the urban population in relation to the total population in a given country. It is obvious that urban growth and urbanisation are not identical. For example, it is possible that on account of natural increase, urban population registers a substantial increase. If, however, the rate of growth of urban population is the same as that of rural population so that the actual percentage of urban population remains stable, urban growth has occurred but not urbanisation. If, on the other hand, urban population increases at a faster rate than rural population so that the percentage of urban population in the total population of the country increases continuously, it is a clear indication that urbanisation is taking place. In India, the percentage increase in urban population has been consistently greater than the percentage increase in rural population for all decades since 1911 indicating increasing urbanisation of the Indian economy over the last 100 years.

In the discussion on urbanisation trends in India below, we divide the period of the last 110 years into 1901-51 and 1961-2011. This becomes necessary in

view of the fact that the urban population figures prior to 1961 and since 1961 are not strictly comparable as, on the eve of the 1961 Census, the definition of urban settlements was substantially revised and made more restrictive, which resulted in the declassification of 810 towns of the 1951 Census.

Urbanisation Trends, 1901-51. The urban population of India in 1901 was 25.9 million, which was 10.9 per cent of the total population of 238.4 million. In 1931, urban population rose to 33.5 million, which was 12.0 per cent of the total population of 279.0 million. In 1951 (the year when the planning process was initiated in the country) India's urban population had risen to 62.4 million, which was 17.3 per cent of the total population. Thus, we can say that roughly one out of every six persons was residing in urban areas in India in 1951. As far as the rate of growth of urban population is concerned, it was less than the rate of growth of rural population in the first decade of the twentieth century (1900-11) but considerably exceeded the rate of growth of rural population in all other decades -1911-21, 1921-31, 1931-41 and 1941-51. For instance, the decadal growth rate of urban population in 1911-21 was 8.5 per cent as against -1.3 per cent decadal growth rate of rural population. The decadal growth rate of urban population over the next three decades was 19.2 per cent, 31.9 and as high as 41.2 per cent respectively. As against this, the decadal growth rate of rural population over these decades was merely 10.0 per cent, 11.8 per cent and 8.8 per cent respectively. This shows that over the period 1911-1951, the pace of urbanisation picked up considerably. In fact, the URGD (urban-rural growth differential) in 1941-51 was as high as 32.4 (the decadal urban growth rate in this decade being as high as 41.2 per cent against the decadal rural growth rate of only 8.8 per

cent).

Urbanisation Trends, 1961-2011. Urbanisation trends in India over the last 50 years (1961 to 2011) are presented in Table 2.

Table 5.2: Rural-Urban Distribution of India's Population, 1961-2011
(Population in million)

Year	Total Population	Rural Population	Rural increase Over previous Census	Urban population	Urban Increase Over Previous Census	Urban Population as percentage of total Population	Decadal growth rate of rural population	Decadal growth rate of Urban population	URGD*
(0)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)= (9)-(8)
1961	439.2	360.3	—	78.9	—	18.0	—	—	—
1971	548.2	439.0	78.7	109.1	30.2	19.9	21.8	38.3	16.5
1981	683.3	523.9	84.9	159.5	50.4	23.3	19.3	46.2	26.9
1991	846.3	628.7	104.8	217.6	58.1	25.7	20.0	36.4	16.4
2001	1,028.7	742.5	113.8	286.1	68.5	27.8	18.1	31.5	13.4
2011	1,210.2	833.1	90.6	377.1	91.0	31.2	12.2	31.8	19.6

Note: URGD: Urban-Rural Growth Differential.

Source: Census of India 2001 and Census of India 2011.

Important results that can be obtained from this table are as follows:

In 1961, India's urban population was 78.9 million, which was 18.0 per cent of the total population. By 2011, it had increased to 377.1 million, which is 31.2 per cent of the total population. Thus, now a little less than one out of three persons in India lives in urban areas. It may be pointed out at this juncture that by 2030, India's urban population is projected to increase further to 600 million which would be 42.8 per cent of India's total population of about 1,400 million.

The decadal growth rate of urban population has consistently been higher than the decadal growth of rural population (see columns 8 and 9). Over the last decade 2001-11, while rural population increased by 12.2 per cent, urban population increased by as much as 31.8 per cent. Urban growth at 46.2 per cent was fastest during the decade 1971-81. It declined to 36.4 per cent during the 1980s, 31.5 per cent during the 1990s and 31.2 per cent during the last decade 2001-11. While urban population registered a decadal growth of 46.2 per cent in 1971-81, the rural population increased by only 19.3 per cent. As a result, URGD (urban-rural growth differential) was as high as 26.9. This fell thereafter and stood at 19.6 in 2011.

The urbanisation data for the latest Census 2011 has attracted a lot of attention of the scholars and media because the decadal increase in the size of urban population (by 91.0 million people over the decade 2001-11) was greater than that of the rural population (by 90.6 million) for the first time since Independence.

The increase in urban population is the outcome of three separate factors:

- (i) the natural increase in population within urban areas,
- (ii) the migration of people from rural to urban areas, and
- (iii) the reclassification of settlements from rural to urban.

All three factors have been at work over the past decade. The most important reason for the growth in the number of urban settlements in the 2011 Census is the significant increase in the number of 'census towns' - that is, in places that are not recognised as urban areas in a statutory sense but fulfil the criteria laid down by the Census. In 2001, of the total number of 5,161 towns, 3,799 were statutory towns and 1,362 were census towns. In 2011, the

total number of towns rose to as high as 7,935 of which statutory towns were 4,041 and census towns were 3,894. Thus, while the number of statutory towns rose by only 242, the number of census towns increased by as much as 2,532. This shows that 90 per cent of the increase in the number of towns is accounted for by census towns.

Regional Pattern of Urbanisation. The results of 2011 Census reveal that the biggest trend towards urbanisation is in Southern India, where all States except Andhra Pradesh have more than 35 per cent of the population living in urban areas. In Tamil Nadu, as much as 48.5 per cent of the total population (i.e., roughly half of the total population) lives in urban areas. In Kerala 47.7 per cent, in Karnataka 38.6 per cent and in Andhra Pradesh 33.5 per cent of the population lives in urban areas.

The Southern States also saw the fastest economic growth in the last decade, drawing in associated migration from other States. In 2007-08, the economies of Kerala, Karnataka and Andhra Pradesh grew at 10.42 per cent, 12.92 per cent and 10.62 per cent respectively.

Among other States, Haryana, Punjab, Uttarakhand, West Bengal and Manipur have seen faster urbanisation than the rest of the country. Gujarat and Maharashtra already had more than 35 per cent living in urban centres in 2001 (in 2011, 42.6 per cent of Gujarat's population and 45.2 per cent of Maharashtra's population lived in urban areas.)

In terms of urban population, the top three States are Maharashtra with 50.8 million, Uttar Pradesh with 44.4 million and Tamil Nadu with 34.9 million.

States Registering Fastest Urbanisation. The 2011 Census numbers show that Kerala's urban population has gone up from 26 per cent of its total population in 2001 to 47.7 per cent in 2011, a growth of 21.7 percentage points. This is the highest percentage difference between the urban populations of 2001 and 2011 for any State. The State registering the second highest growth in urban population is Sikkim. This State's urban population increased from 11.1 per cent of the total population in 2001 to 24.97 per cent -an increase of 13.9 percentage points. Goa registered the third highest growth in urban population from 49.77 per cent in 2001 to 62.2 per cent in 2011 (an increase of 12.4 percentage points).

Growth of Cities and Urban Agglomerations. Table 3 presents information on cities and urban agglomerations since 1951. This Table clearly brings out the 'pressure' on cities and UAs in India. The number of cities with population of 1,00,000 and above was 72 in 1951 and 44.6 per cent of the urban population of the country lived in them. The number of cities and UAs has now risen to 468 and as much as 70 per cent of the urban population lives in them. In other words, every 7 out of 10 people in urban areas live in Class I cities. Table 3 also reveals that 21.9 per cent of the total population of the country lives in Class I cities (in other words, one out of every five persons in the country lives in cities and urban agglomerations).

Table 1.6.3: Number of Cities and UAs with a Population of 1,00,000 and above and their Population Growth Rate, India, 1951-2011

Year	Number of Cities and UAs	Population (Millions)	As percentage of		Decadal Growth Rate (Per cent)
			Urban	Total	
1951	72	27.5	44.6	7.8	65.2

1961	102	39.9	51.4	9.3	45.0
1971	148	61.2	57.2	11.4	53.5
1981	216	94.5	60.4	14.3	54.4
1991	300	140.1	64.9	16.7	48.2
2001	394	193.0	67.6	18.8	37.8
2011	468	264.9	70.0	21.9	37.2

Census of India, 2011

Million Plus Urban Agglomerations. In 1971, the UAs having population greater than one million each were nine in number - Kolkata, Greater Mumbai, Delhi, Chennai, Hyderabad, Ahmedabad, Bangalore, Kanpur and Pune. The number of million plus UAs increased to 12 in 1981, 23 in 1991 and 35 in 2001. In 2011, the number of million plus UAs rose further to 53 and 43 per cent of the urban population lives in them.

Mega Cities

The United Nations considers mega cities as those that have a population of 10 million and above. Under this definition, we have three mega cities -Greater Mumbai UA (18.4 million), Delhi UA (16.3 million) and Kolkata UA (14.1 million). The largest UA in the country is Greater Mumbai UA, followed by Delhi UA, Kolkata UA which held the second rank in 2001 Census has been replaced by Delhi UA. The growth in population in the mega cities has slowed down considerably during the last decade. Greater Mumbai UA, which had witnessed 30.47 per cent growth in population during 1991-2001, recorded 12.05 per cent growth in population during 2001-2011. Similarly, Delhi UA (from 52.24 per cent in 1991-2001 to 26.69 per cent in 2001-2011) and Kolkata UA (from 19.60 per cent to 6.87 per cent in 2001-2011) have also

slowed down considerably.

As far as combined population of these three mega cities is concerned, it was 42.5 million in 2001 and 48.8 million in 2011. In 2011, 13.0 per cent of the total urban population of the country lived in these three mega cities alone.

Trends supporting urbanisation in India

Here are some key points regarding urbanization and planning in India:

- Private cities are now expanding due to the support of private companies. Private developers are building private housing projects that will exponentially grow in the years to come.
- The Delhi-Mumbai Corridor is an infrastructure program set to develop 'Smart Cities' and combine next-generation technology with infrastructural development.
- The transport and logistics sector of India underlines the importance of interconnecting the different modes of transportation: road, rail, sea and air. An efficient multi-modal system is relevant in the development and successful growth of the infrastructural systems.
- Special Economic Zones dot the landscape of India. Each of these zones is focused on a particular sector such as IT, apparel and fashion, or petroleum and petrochemical industries.
- Industrial townships are built to house employees close to the factories and manufacturing plants at which they work. After the success of the pioneering industrial township - Tata's Steel Town - the government is planning on developing more like it.
- India's expected economic growth opens up expansion prospects for Indian airports. Domestic and international passengers are inevitably predicted to double in number in the years to come.

Spatial planning in India

There are two types of planning systems laid out in the Indian urbanisation and spatial development agenda to carefully combat the complications and explore the potential of urbanization.

1. A new institution named National Institution for Transforming India (Hindi: NITI Aayog, Policy Commission) is a new planning system which aims to target cooperation and active participation in the economic policy-making process led by the State governments of India. This NITI Aoyag was made to replace the dated Planning Commission of India.
2. The central government Urban Development (MoUD), Ministry of Housing and Urban Poverty Alleviation (MoHPA), and the Town and Country Planning Organization (TCPO) will facilitate and support the nationwide urban and regional development planning. These organizations place their efforts on spatial planning for the improvement of the entire country.

India's Seven Mission Program

With the rapid rise of urbanization in India, there is an increase in overall development in the different sectors. Due to this, the Seven Mission Program was founded. This program aims to fund cities to achieve intended milestones.

The Seven Mission Program includes the following plans:

- 100 Smart Cities Mission
- AMRUT stands for 'Atal Mission for Rejuvenation and Urban Transformation'

- HRIDAY (National Heritage City Development and Augmentation Yojana)
- Sardar Patel National Urban Housing mission
- National Mission on sustainable habitat
- Clean India mission
- National urban information system

1.6.5 Causes of Urbanisation in India:

Rapid urbanisation is taking place in different parts of the country in and around some big cities and towns of the country. The growing trend of urbanisation as reflected in growing concentration of major proportion of urban population in some big cities.

The factors which are largely responsible for such rapid urbanisations are mentioned below:

(i) Natural Increase in Population:

Rapid urbanisation is taking place as a result of high rate of natural increase in population. Natural increase is taking place when the birth rate in urban areas exceeds the death rate. The natural growth rate of urban population is higher than that of rural due to higher net survival rate arising out of better health and medical facilities.

Improvement in health and medical facilities, drinking water supply and sanitation facilities have reduced the incidence of water-borne diseases, communicable diseases etc.

Accordingly, the birth rate in urban areas in 1971 was estimated at 30.1 per thousand as compared to the death rate of 9.7 per thousand which subsequently reduced to 24.3 and 7.1 per thousand in 1991. Thus the natural growth rate is stated too high because of large difference between birth and death rates.

The death rate in urban areas declined considerably due to better availability of medical and health service, safe drinking water supply and improved sanitation facilities.

This natural increase in population is largely responsible for phenomenal growth of population in urban areas i.e. 46 per cent in 1971-81 and 36 per cent in 1980-91 decade as compared to that of 19 per cent and 20 per cent growth rate attained in rural areas of India during these two decades.

(ii) Migrations:

Rural-urban migration is considered another important factor responsible for rapid urbanisation in India. The rural to urban migrations have been resulted due to many factors during the post-independence period. Creation of many activities of manufacturing and trading as a result of industrial development has resulted migration of rural people to urban areas for seeking jobs and higher incomes as well.

After the partition of the country in 1947 rural uprooted people started to settle down in urban areas. Poor living conditions and negligible arrangement in respect of education and health have also attracted large number of rural people to migrate and settle in urban areas in search of

good education, health facilities, better living conditions and securities of life.

As a result of heavy public investments in industry and mining, huge industrial development and sustained agricultural development urbanisation takes place. Thus due to these “pull factors”, large number of rural people migrate to urban areas.

However, there are certain “**push factors**” where due to worse economic conditions a number of rural people are pushed out of villages due to economic compulsions. Thus in the current phase of urbanisation both the “**pull factor**” and “push factor” are very much operational.

(iii) Expansion of Industry and Trade:

In recent years, urbanisation takes place with the growing expansion of industry and trade in a particular state of region. Growth of an industry with its ancillaries along with localisation of industry would always create a favourable situation for the growth of an urban set up.

Similarly, growth of business and trade along with establishment of an active market always provides adequate support toward growing urbanisation in those places related to the development of industry and trade.

(iv) Boundary Changes of Towns:

With the extension of the boundaries of cities and towns, more and more rural areas are gradually being included in urban areas. Although life in these newly extended areas remains rural initially but the inclusion of these

areas into these towns and cities necessarily increases the number of urban population.

1.6.6 Migration of rural population to urban areas in India

Since independence there has been explosive growth of big cities due to migration. For example, population of Bangalore increased by 75.6 per cent during 1971-81. Population of Asansol in West Bengal increased by 108.7 per cent, of Faridabad in Haryana by 85.5 per cent, of Guwahati in Assam by 188.3 per cent, of Thane in Maharashtra by 105.9 per cent, of Visakhapatnam in Andhra Pradesh by 75.0 per cent and of Bhubaneswar in Odisha by 87.7 per cent during 1981-91. Similarly, population of Surat in Gujarat increased by 85.1 per cent and of Nasik in Maharashtra by 58.9 per cent during 1991-2001. The population of mega cities Delhi UA, Greater Mumbai UA and Kolkata UA increased by 52.24 per cent, 30.47 per cent and 19.60 per cent respectively over the decade 1991-2001. The population of these cities increased further by 26.69 per cent, 12.05 per cent and 6.87 per cent respectively over the decade 2001-11. Many other big cities have also recorded very high rates of population growth in different decades. As a result, Class I cities with a population of 1,00,000 and above accounted for 70.0 per cent of the total urban population in 2011 as against 44.6 per cent in 1951.

Causes of Migration

In India, about 60 per cent of migrants make intra-district moves. The second most common type of migrants are those who move between districts. These are short distance migrations. About 11 per cent of migrants move between States. As women usually move to their husbands' villages at marriage, female migration is more prominent than male migration.

The factors influencing rural-urban migration are varied and complex. In earlier times, migration from rural to urban areas was largely on account of non-economic factors, such as social, physical, demographic, cultural and communication factors. In villages, social organisations are rigid and, in the past, people who wanted to break away from these organisations used to migrate to cities. Climatic and meteorological disasters like floods and droughts often compelled the people to leave villages. In recent times, with the decline in mortality rates which resulted in rapid population growth in rural areas, young people have shown a tendency to look for jobs in the cities. Improved transportation, urban-oriented education and modernising impact of cinema, radio and television have also induced migration of people from rural to urban areas.

All these non-economic factors are even now relevant. However, now there is widespread agreement among economists and non-economists alike that migration is caused mainly by economic factors. These include "push" from subsistence agriculture and "pull" of relatively high urban wages and "push back" toward rural areas as a result of high urban unemployment.

1. Push from subsistence agriculture

In India, for agricultural workers and small and marginal farmers, agriculture is a subsistence activity. Small and marginal farmers possess small holdings which often do not ensure productive employment to all the adult male members of the household. On small holdings there is a considerable amount of disguised unemployment which implies that productivity of many persons working on these farms is almost nil. These persons all the time feel

pressure to migrate to cities. Most agricultural workers find only seasonal work and the wages which they earn from this work are not enough for their subsistence. Hence, they look for some other work in their own or nearby villages which is not easily available due to total neglect of industrial and business activity in the countryside. Even activities allied to agriculture have not received the required attention. Dairying and poultry farming are now being encouraged. Some attention is being given to the development of rural infrastructure. The fact, nevertheless, remains that the growth of new jobs in the countryside is slower than the rate of workforce growth. Therefore, a large migration of rural population to cities is due to the 'push' factor.

2. High urban wages

Money is the main consideration for the masses and wages in urban areas are generally higher than rural areas and moreover in urban areas there are trade unions which will protect a workers' rights. In urban areas, in industries workers get fair wages. Generally, people of age between 15 and 24, male and poor rural people migrate.

1.6.7 Urban Challenges

The above discussion clearly brings out the 'pressure' of population on large urban areas - i.e., cities and UAs and mega cities. In fact, the disparity in growth rates between large and small and medium-sized towns has increased significantly as urbanisation process has got concentrated over time in large cities and developed regions, particularly during the period of the last two decades. Another problem that needs specific mention in the context of the 2011 Census, is the phenomenal growth in the number of census towns. As stated earlier, the number of towns increased by 2,774 in just one

decade 2001-11 and of this, 2,532 were Census towns, i.e., 90 per cent increase was due to census towns. As villages grow in size and start including a greater proportion of the workforce engaged in non-agricultural activities, they will increasingly turn 'urban' in the form of census towns. However, they will continue to be outside of the administrative and policy framework that is designed to deal with urban areas. In this context, the following questions arise:

1. In the absence of the institutional framework of a municipality, how are the standard problems relating to urban infrastructure - provision of utilities such as electricity, water and sanitation and other services - to be dealt with?
2. To what extent has the planning process (and policy making generally) incorporated the needs and requirements of these areas? For example, have any plans been put in place to evolve a proper mechanism of land use, provision of schools, health care centres, community services, and the like? What steps have been taken to ensure proper 'spatial provisions' such as sufficient open spaces, public parks and play grounds, and avoiding congestion?

The Approach Paper to the Twelfth Plan has noted the urban challenges that the country is likely to face in the coming years because of the mushrooming of census towns as these towns do not have an urban governance structure or requisite urban infrastructure of sanitation, roads, etc. In this context, the Approach Paper states, more Indians will inevitably live within urbanised conglomerations, with densification of villages, building of peri-urban centres around large towns, and also migration of people into towns, the quality of their

lives and livelihoods will be affected by the infrastructure of India's urban conglomeration. The infrastructure of India's present towns is very poor. Sewage, water, sanitation, roads and housing are woefully inadequate for their inhabitants. The worst affected are the poor in the towns. As more urban conglomeration form and grow without adequate infrastructure, the problems will only become worse. Therefore, India's urban agenda must get much more attention. Twelfth Plan proposed to launch JNNURM II with the following objectives:

- (1) alleviating urban poverty;
- (2) improving service delivery standards in urban areas including basic services for urban poor;
- (3) empowering urban local bodies;
- (4) facilitating participatory governance;
- (5) effectively managing land resources; and
- (6) fostering retainable, inclusive and faster growth.

Opportunities in India's urban infrastructure

In order to face the challenges of urbanization, infrastructures need to be improved. Unfortunately, rapid population growth and a lack of adequate investment is making urban infrastructure growth slow.

Affordable housing in India

India is facing a house shortage in urban areas at this moment and more housing would be required in order to meet future demand. This demand comes from the economically weaker section due to lack of housing policies. Some parts in India have introduced public-private-partnership policies, which have led to the development of housing.

Transport business opportunities in India

Private mode of transport is dominant in India. There is a heavy reliance on private transport, which has led to the congestion of roads and increasing commuting time and pollution. Road networks therefore need to increase because of the influx of these vehicles. On a separate note, public mode of transport is gradually decreasing in terms of popularity. In an effort to improve the urban transport situation in India, new metro rail networks have been developed.

Water and wastewater management in India

The water supply in India faces several issues and the water and wastewater management in the country needs to be improved. The government though has made initiatives to improve water supplies establishing projects for selected areas. Sewage and sanitation is also facing a dilemma in India at this moment. Nevertheless, projects to further improve this is currently a work in progress.

Power and power infrastructure requirements in India Increasing urbanization has led to increasing demand in energy consumption. India greatly needs to increase their power-generating capacity and develop new ways of generating power.

1.6.8 Consequences of Rapid Urbanisation:

The rapid urbanisation is subjected to both healthy and unhealthy consequences and aspects.

(i) Healthy Aspects:

Rapid industrialisation results the development and setting up of many industrial cities. Along with manufacturing units, ancillaries and service sector started to grow in those urban areas. Secondly, new and additional employment opportunities are created in the urban areas in its newly expanding manufacturing and service sector units.

This would result rural-urban migration and “**industrialisation-urbanisation process**” to set in. Thirdly, growth of cities can give rise to external economies so as to reap the benefit of economies of scale for various services and activities.

Finally, urbanisation results changes in attitudes and mind set of the urban people resulting modernisation in behaviour and proper motivation which indirectly helps the country to attain faster economic development.

(ii) Unhealthy Aspects:

Although development of the economy is very much associated with urbanisation but it has resulted some serious problems. Firstly, growing urbanisation is largely responsible for increasing congestion in the urban areas. Too much congestion has resulted problems like traffic jams, too much concentration of population, the management of which is gradually becoming very difficult and costly.

Secondly, too much of population is another unhealthy aspect of urbanisation which creates urban chaos related to housing, education, medical facilities, growth of slums, unemployment, violence, overcrowding etc. All these would result in deterioration in the quality of human life.

Finally, as a result of urbanisation, large scale migration takes place from rural to urban areas. Such large scale migration of active population from rural areas would result loss of productivity in rural areas, leading to poor conditions in village economy. Thus urbanisation, beyond a certain point, would result in unhealthy consequences.

(iii) Urban Policy Measures:

Considering unhealthy consequences of rapid urbanisation, it is quite important to formulate an urban policy which can provide urban development with minimum undesirable effects.

The measures which can be largely followed include:

- (i) Integrating urbanisation process with the development plans of the country for developing non-agricultural activities like manufacturing services and infrastructure leading to attainment of external economies,
- (ii) Making arrangement for selective urban development so as to minimise the disadvantages of these large sized towns,
- (iii) To develop rural districts, by developing towns in highly rural districts,
- (iv) To develop satellite townships in and around large cities; and
- (v) Relieving pressure on large urban centres by developing urban amenities in adequate quantities so as to make urban living peaceful.

1.6.9 Role of Urbanisation in Economic Development of India:

Urbanisation and economic development are closely associated. Economic development of a country indicates increase in the level of per capita income and standard of living along-with the enlargement of employment

opportunities for its growing population. With the attainment of economic development and growing industrialisation, the process of urbanisation starts at a rapid scale.

Some areas emerge as a large urbanised centre with large scale industrial and trading activities. These areas started to offer increasing number of employment opportunities leading to a shift of population from rural areas to these urbanized centres. Thus economic development of a country assists in its process of urbanization.

Growing industrialisation raises the rate of economic development along-with the pace of urbanization in the country. Increase in the rate of economic development raises the level of per capita income and standard of living of the people which in turn enlarges the demand for various goods and services. This increase in aggregate demand expands the production system leading to a large scale production of various goods and services.

All these lead to increase in the pace of urbanization in the country. Thus there is a good correlation between the level of per capita income and the pace of urbanization. In India, the coefficient of correlation between the proportion of urban population to total population and the level of per capita income is estimated at 0.5, which is significant.

Moreover, economic development paves way for growth of cities and towns. Thus with the increase in the number of cities and towns the proportion of urban population to total population is also increasing.

But higher degree of urbanisation cannot reduce the degree of unemployment in India significantly through the absorption of increasing number of surplus labour force from rural areas as the scope for raising urban employment is also limited. In India there is an insignificant positive correlation (0.18) between the proportion of urban population and the rate of daily status of unemployment.

Moreover, there is a mild negative correlation, i.e., 0.22, between the proportion of urban population and the percentage of population below the poverty line in India.

Factors which are responsible for this typical situation are:

- (a) neglect of urban slums in our planning coverage;
- (b) growing exploitation of unorganised sectors by capitalists, contractors, landlords etc. and
- (c) increasing application of capital intensive techniques in urban areas.

Thus in comparison to the degree of urbanisation achieved in India, the absorptive capacity of the urban centres is very low. This shows the reason why urbanised centres in India could not make much headway in reducing the degree of unemployment in the country.

1.6.10 Conclusion

Population and economic growth has fostered urbanization in the country and the number of urban towns and cities have drastically increased. This growth is expected to continue in the years to come and India has to step up its game in order to catch up with this kind of change. Investments have to

be made in order to better serve the country. There are several factors that have led to the urbanization in India – population growth and migration as one of the two major factors. Recently, a third factor has been emerged as a huge contributor to the urbanization growth: the expansion of towns and cities. This factor is due to the high economic growth that the city has witnessed over the years. Because of this, the government in India has decided to grab the opportunity: projects to further thrust the country into urbanization, a number of smart cities to be put up in various locations, and other initiatives. It can be observed that the attainment of high rate of economic development paves the way for growing urbanization along-with the increase in the level of per capita income and the development of various urbanized infra-structural facilities like transportation and communication, housing, education, health, trade, banking etc. Growing urbanisation has also led to huge concentration of population in urban areas, resulting in various evils side by side such as growth of slums, increasing congestion and pollution, problems of transportation, housing, water supply, health services, unemployment and poverty etc.

1.6.11 Short answer type questions

Write short notes on:

1. Urbanisation trends in India
2. Causes of urbanization
3. Consequences of urbanization
4. Role of urbanization

1.6.12 Long answer type questions

1. Define urbanization. Explain its classification and trends in India.
2. Explain the causes and consequences of urbanization in India.

ECONOMIC DEVELOPMENT AND ENVIRONMENT DEGRADATION

Structure:

- 1 Introduction
- 2 Objectives of the lesson
- 3 Environment and Development:
 1. Air Pollution
 2. Water Pollution
 3. Solid Wastes
 4. Bio-diversity
 5. Soil Degradation
 6. Deforestation
 7. Atmospheric Changes
- 4 Conclusions
- 5 Suggested Readings
- 6 Questions

1. Introduction: In recent years, the association between environment and economic development is widely being recognized by the academicians as well as the policy makers. It is being realized that environmental degradation can undermine future productivity leading to lower growth rates or the existing growth rates can not be sustained. So, the emphasis is on sustainable development. By sustainable development we mean meeting the needs of the present generation without compromising the ability of the future generations to meet their own needs. Thus, sustainable development can not be obtained without environmental protection.

2. Objectives of the Lesson: This lesson has the following objectives:

1. To know the relationship between environment and economic development.
2. To know various aspects of environment degradation during the process of development of India.
3. To know about the strategies to overcome the depletion of natural resources.

3. Environment and Development: The growing population, high degree of mechanisation and steep rise in energy use has led to activities that directly or

indirectly affect the sustainability of the environment. There has been a reduction in forest cover (hence reduction of sink for the carbon dioxide and soil degradation), contamination of surface and ground water and pollution of the air with Suspended Particulate Matter (SPM), Respiratory Particulate Matter (RPM), hydrocarbons and acid gases, all of which are causing health problems. There is dumping of poisonous waste on grounds. Most of the country's water resources are polluted due to discharge of untreated/partially treated wastes from industry, domestic sewage and fertiliser/pesticide runoff from agricultural fields.

After independence, for rapid economic growth India adopted a series of economic plans for growth of industry, agriculture and transport. For development of agriculture, dependence upon irrigation facilities, chemical fertilizers, pesticides etc was increased. On the other hand for development of industry there was emphasis on more and more exploitation of natural resources. Development of agriculture and industry has been accompanied by development and expansion of infrastructure-namely of power, transport, communications etc. In many cases, ruthless exploitation of resources has degraded our physical environment, which has endangered future speed of economic growth in India. The damage done to the natural resources of India during the process of economic development is given as follows:

1. Air Pollution: The main source of air pollution is combustion of solid fuels (coal, lignite, wood etc.) and liquid fuels (from petroleum source). The need for more electricity has led to a steep rise in power generation through coal as India has limited reserves of natural gas. Increased economic activities and urbanisation have increased vehicular traffic using diesel and petrol, both of which add to NO₂ and SO₂ emission in cities. Heavy vehicles, which mainly use diesel as fuel, emit large quantities of RPM. Shortage of electric power has also led to the increased use of diesel generator sets in the commercial, household and agriculture sectors. 500 units per month consumption of power by a household would require about 300 kg of coal burning per month or 10 kg per day. This would produce more than 300 kg of CO₂, apart from several other pollutants.

Air pollution is a potential health risk and has led to an increase in respiratory diseases in cities. Central Pollution Control Board (CPCB) has established a national air quality monitoring network covering 290 stations spread over 90 cities and towns. While the level of acid gases are much below the prescribed standard, the high level of SPM in many locations (69 locations out of 170) is a matter of concern. According to World Health Organization (WHO) if SPM level could be brought down at the safe level, about 3-7 lakh premature deaths could be averted in developing economies. The high SPM levels alone account for 2-5 per cent of all deaths.

2. Water Pollution: The major rivers of the country suffer from reduction in flow while entering the plains and passing through cities (because of water being drawn for irrigation and drinking water supply in cities). At the same time, they receive polluted discharge, the main pollutants being fertilisers and insecticides, untreated municipal sewage and industrial effluents. Central Pollution Control Board (CPCB) of India has been monitoring water quality, BOD (Biological Oxygen Demand), total coliform and faecal coliform at 507 locations with concerned State Pollution Control Boards. Water quality monitoring results obtained during 1998 indicates that organic and bacterial contamination continues to be critical sources of pollution in Indian aquatic resources. The number of observations having high coliform density has increased in 1998 against 1997. According to latest estimates, between 1947 and 2002, average annual per capita availability of water declined by almost 70 per cent reaching to 1822 cubic metres.

CPCB has also carried out limited water quality monitoring of wells in different States and has found dissolved oxygen and total coliform levels far beyond the permissible limits in many cases. The Central Water Commission's (CWC) studies on chemical composition of ground water in a few areas have revealed a high concentration of nitrates, potassium and even phosphates in many cases, while they are virtually absent or have low concentration in other places. This points to the improper use of chemicals, fertilisers and poor water management. In areas where intensive industrial activity, there is high concentration of heavy/toxic metals in different proportions in ground water. Even with strong legislative provisions, 851 defaulting industries were functioning along the rivers and lakes in 1997 (Tenth Plan Vol. 2). This increasing level of water pollution is not only dangerous to human life but also affects the fisheries. Due to water pollution, the incidence of water born diseases has been increasing leading to deaths (particularly of children) at a massive scale.

3. Solid Wastes: Solid wastes can be classified under two heads- municipal wastes and industrial wastes. These are discussed as follows:

a. Municipal solid waste: The 2001 Census estimates the urban population at 27.8 per cent of the total population. It is expected to grow at 4 per cent per annum and would account for 40 per cent of the total population in the next ten years. Due to lack of infrastructure, the proper collection, transportation, treatment and disposal of solid waste by most municipalities has become a subject of concern. As per an estimate, the present annual generation of solid waste in Indian cities has increased from 6 million tones (mt) in 1947 to 48 mt in 1997 and is expected to increase to 300 mt by 2047. Though it is difficult to give an exact estimate of the per capita rate of generation of solid waste yet according to some rough estimates, it can be said that on an average it ranges between 400 and 500 g/capita/day.

Most surveys have found the organic component of the waste to be around 40 per cent. The share of recycled waste has increased over the years mainly due to the increased content of plastic. Due to lack of awareness and absence of legislation, till recently medical wastes were also deposited and mixed with municipal waste collection. The Director General of Health Services estimates that 54,404 mt of medical wastes are generated in the country every year (based on a generation figure of 250 g/capita/day).

The average waste collection in Indian cities is 72 per cent and only 70 per cent of cities have adequate waste transport facilities. There is a lot of littering at collection centers and also during transportation. Unscientific disposal practices leaves waste unattended at the disposal site and this attracts birds, animals and micro-organisms which create a health hazard. Plastic contents of the waste are picked up by rag pickers for recycling. This recycling is carried out in small factories with no adequate technology, leading to the emission of toxic fumes.

b. Industrial Waste:

Hazardous industrial wastes include sludge contaminated with heavy metals, wastes from paints, dyes and organic chemical units and highly acidic and alkaline wastes. The relatively more industrialized states like Gujarat, Maharashtra, Tamil Nadu and Andhra Pradesh face problems relating to toxic and hazardous waste. The major hazardous waste generating industries are petroleum and petrochemicals, pharmaceuticals, pesticides, paint and dyes, fertilisers, inorganic chemicals and general engineering industries etc. The presence of toxic chemicals in solid/liquid effluents from industries and other activities leads to ground water contamination. Direct contact with and exposure to hazardous waste can also lead to diseases or chemical poisoning.

As per the facts given by the Tenth Plan, around 7.2 mt of hazardous waste are generated in the country, out of which, according to one estimate, 1.4 mt are recyclable, 0.1 mt to be incinerated and 5.2 mt to be disposed on land. The hazardous waste of 5.3 mt would require about Rs. 1,600 crore a year for treatment and disposal at an estimated rate of Rs. 3,000/ tonne. In addition, land required for disposal will be around 1 square km, taking a depth of 4 m and density of disposal as 1.2 tonnes per cubic meters. Moreover, 60 per cent of power generated in India is from coal. The total ash generated in India per year is about 100 mt. so, if there are 200 coal field power plants, each will produce coal heaps covering space of seven football grounds upto a height of 5 meters, unless proper ash disposal is done (as per a report in Economic Times).

4. Bio-diversity: biological diversity is a sum total of species and ecosystem. For a perfect harmony of the flora and fauna (vegetation and living things) the bio-diversity must be maintained so that human beings and nature complement each

other. The sustainable use of bio-diversity is fundamental to ecologically sustainable development. India is one of the 12 mega diversity countries of the world. However, during the past few decades, industrialisation has put a strain on the eco-system, altering and even destroying it. The loss of bio-diversity stems from destruction of the habitat, extension of agriculture, filling up of wetlands, conversion of rich bio-diversity sites for human settlement and industrial development, destruction of coastal areas and uncontrolled commercial exploitation. This has caused a severe ecological imbalance which creates hinderances to sustainable development.

5. Soil Degradation: degradation of soil quality can be due to various reasons such as waterlogging soil erosion, salinisation etc. soil erosion takes place when surface soil is washed away through excessive rains, floods, deforestation, uncontrolled grazing by cattle and wrong methods of cultivation. Similarly, the soil is damaged due to water logging in highly irrigated areas, which adversely affects the fertility of the soil. The loss of soil fertility due to soil degradation is though, difficult to estimate, yet according to a report by Centre of Science and Environment, New Delhi, the total annual losses to agriculture due to environmental degradation may be several times more than annual budgets of central and state agricultural ministries combined. Around 6000-7000 mt of soil eroded lose several major nutrients of the soil, which converted to market price may be worth Rs 15000 cr annually. Similarly, according to estimates by National Commission of Environmental Planning, at least 25 per cent of total irrigated land in India is under the threat of waterlogging and salinity, which is seriously endangering the productivity of the effected land in near future. It is also estimated that between 4.7 and 12 billion tones of top soil are lost annually from soil erosion.

6. Deforestation: Forests protect and enrich soils, provide natural regulation of the hydrological cycle and help to stabilize the climate by confiscating carbon as they grow. To achieve faster economic growth, the policies were adopted for new agricultural technology and rapid industrialization. The most affected area due to such policies was the forest cover of the country. Between 1951 and 1972 alone 70 per cent of the forest area was lost to agriculture another 17 per cent was lost to the river valley projects, industries, road, communications and other infrastructure projects. Even today 1.3 to 1.5 million hectares of forests are disappearing annually. This has been leading to ecological imbalance, increasing floods, soil erosion etc which causes a huge economic loss annually.

7. Atmospheric Changes: Under the name of economic growth, the irrational policies of industrialization, urbanization, change in agricultural technology has led to massive environmental pollution which in turn has brought some undesirable, irreversible and uncertain atmospheric changes. The environmentalists today are

very much worried about the threat of emission of greenhouse gases (GHGs) and ozone depletion. The emission of GHGs into atmosphere leads to a rise in global temperature. This would lead to drier soils and substantial rise in sea level. As a result, agriculture and coastal activities would suffer, leading to huge economic loss. The Indian Agricultural Research Institute has estimated that a three degree centigrade rise in temperature will result in a 15-20 per cent loss in annual wheat yields. On the other hand the ozone depletion, which is mainly caused by the increasing concentration of chlorine originated by chlorofluorocarbons (CFCs) can have adverse effects on human health, plant productivity, forestry, fishing etc.

IV. Conclusion: Thus, we have observed that indiscriminate use of the natural resources for achieving faster economic growth causes environmental degradation which leads to a huge economic loss. So, for sustainable development, this trend has to be changed. The major instrument with the State to check environmental degradation is undoubtedly regulation. The country has adopted almost all environmental protection Acts and rules enforced in developed countries. But environmental degradation continues despite the existence of a longstanding policy, and legal-cum-institutional framework for environmental protection. There are a few suggestions for controlling environmental degradation:

1. For control of industrial pollution, limits on effluent discharge have already been laid down. The industry should pay higher penalty if its effluent discharge contains a higher level of pollutants.
2. Vehicular pollution control requires action on many fronts: fuel specifications to match engine technology, more checks on maintenance levels, curbing fuel adulteration, phasing out of two-stroke engines, greater promotion of environment friendly fuels.
3. There is also a need to prevent burning of biomass, garbage or any other material, except approved fuel, in cities and towns to minimize air pollution.
4. A proper legal framework for regulating withdrawals of ground water is not in place. There should be strong efforts to check overexploitation of ground water through licensing, credit or electricity restrictions etc.
5. Municipalities should try to sell bio-sludge to farmers and also supply bio-gas as domestic or industrial fuel at an economic cost.
6. There is a need to stress segregation of garbage into non-biodegradable and biodegradables etc. Segregation is the major step for viable utilisation of waste energy and recovery of recyclable materials. As transportation adds to the cost of handling of wastes, there is need to encourage decentralised waste management and set up decentralised sewage treatment plants.
7. The problem of "Climate Change" is becoming a growing concern of the world community. We should reduce emission of GHGs by improving

efficiency of energy conversion and utilisation, afforestation, stabilising population growth, limiting methane emissions through proper waste management and phasing out subsidies on power utilisation.

5. Questions:

1. How environment is degraded with the process of development? Discuss in Indian Context.
2. Discuss the impact of development strategy of India on environment. What should be the policy options to attain sustainable development in India?

6. Suggested Readings:

1. Rudder Datt and K.P.M. Sundharam (2006), *Indian Economy*.
2. S.K. Mishra and V.K.Puri (2006), *Indian Economy*.
3. Planning Commission (2002), *Tenth Five Year Plan*, Vol.2.