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# UNIT 1 SOCIETY, STATE AND MARKET

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## 1.0 OBJECTIVES

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

- highlight the interrelationship between society, state and markets;
- outline the role of state in a market economy;
- explain the major methods of poverty measurement;
- discuss the concept of inequality and its major methods of measurement;
- state the axioms of poverty and inequality measures;
- describe the relationship between inequality and economic growth in terms of the 'Inverted-U Hypothesis'; and
- analyse the post-reform poverty trends in India.

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## 1.1 INTRODUCTION

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With the growing complexity of development and emergence of modern age society, the organisation of society gradually began to be segmented into three realms viz. the state system (represented by the government institutions and organizations); the market system (represented by business entities and organizations); and civil society (represented by non-government and community-based organizations). The interface among these constituents forms the structural foundation of modern society. In this unit, beginning with an outline of the concepts of society, state and market we examine the interaction among them. The role of the state in the market economy, in the light of issues of social concern like poverty and inequality, will also be discussed. We finally take a look at the post-reform trends in poverty in India.

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## 1.2 INTER-RELATIONSHIP BETWEEN SOCIETY, STATE AND MARKETS

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The term society implies a group of individuals sharing a defined territory and culture including the relationships among the people and the institutions within that group. It is used in different ways. For instance, while it is used to refer to an association of people such as consumer's society, cooperative society, etc., it is also used in a more general sense of a rural or urban society. In sociological terms, the term 'society' refers to a network of social relationship and interactions. Thus, a system of social relationships is the most important aspect of society. 'State', on the other hand, is a sovereign entity holding supreme rule over its territory. It is a body of government making all rules and regulations and consists of officials, institutions and corporations. More specifically, the term 'government' comprises of all constituents of the Union, State and Local governments along with all the government institutions and corporations under their control.

The term 'market' in economics does not necessarily mean a physical place where goods and services are bought or sold. It refers to any medium which allows customers and sellers to interact with each other and facilitate a transaction. Such exchanges between sellers and buyers can take place online where the agents do not meet physically. The equilibrium price of a product or service in a market is determined by the interaction of supply and demand i.e. when the market is in equilibrium, the prices will not change unless some external factors change the very conditions of supply and demand. In a perfectly competitive market, the price mechanism ensures the efficient allocation of resources. However, since in reality markets are rarely perfect it is natural for some distortions in the market to always prevail. It is in the context of dealing with such situations that the role of the state becomes critical to make the markets work efficiently.

Although with the advancement of society, the state and the market can be separated from the society as an institution, they are nevertheless highly interrelated with each other. In a democratic society, members of the society play a dominant role in influencing the decision making process of the state. In this, various social groups like civil society organisations, community based organisations and non-governmental organisations play an important role. The state also facilitates their involvement by providing various rights to their citizens in the form of constitutional rights, right to vote, etc. thereby making them participate in the decision making processes.

The above relationship between the state, society and market is, thus, dependent on the system of democratic governance which allows for the formation of the societal groups. Such groups and organisations complement the government and the market by

their vigilance in keeping the governance system well functioning thereby aiding the attaining of efficiency and justice in economic growth. The market makes efficient allocation of resources only when there are no externalities. A vibrant and vigilant civil society helps by making the state and market more responsive, accountable and efficient. For this, a strong and able governance structure is required. In such conditions, many market distortion can be expected to be corrected through effective state intervention. However, since many a times government failures also can occur, the market failures can be minimised by a more developed and responsive civil society/organisational groups. An illustration of a situation when state intervention in the market to promote public interest can be cited is the price controlling mechanism using the instruments of taxes and subsidies. For instance, if the government wants to increase the market demand for low carbon energy such as solar energy, it can be done through providing tax incentives and subsidies to invest in producing solar energy. In other words, although markets can allocate resources efficiently, the state has to provide an efficient incentive and regulatory framework to facilitate the market to work efficiently. Since market is not always competitive, involvement of the government and social institutions are equally crucial in the efficient functioning of the market and the economy. Thus, development and activation of social capital and its use in the state and market governance is quite essential for economic, political and social development of a country. We shall read more about the theoretical arguments for government intervention in the succeeding section.

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### **1.3 ROLE OF STATE IN MARKET ECONOMY**

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In a market economy, price mechanism makes an efficient allocation of resources to produce various goods and services through the forces of supply and demand. However, market failures and market imperfections, which occur largely due to externalities and lack of information to consumers and producers, adversely affect the functioning of market in efficient allocation of the scarce resources. For instance, in the absence of state regulation, producers may generate negative externalities by releasing solid, liquid and gaseous wastes into the atmosphere, as the cost of dumping such wastes may be negligible to them. Further, producers can also exploit the consumers through forming of cartels and exercising monopoly power. In such situations, the role of the state is critical in making the markets work in a fair and efficient manner by taking measures to internalise the externalities.

Role of the state in the market economy has been debated for long. Classical economists advocated minimum role for government by arguing that the ‘best government is the one which governs the least’. However, the great depression of 1930s made the economists rethink the relevance of government intervention in the market economy. Experiences of a number of developing countries in the recent decades also indicate that not only the market fails in resource allocation, but sometimes even the government fails in its functions to remove the market distortions. In fact, government failures may be more detrimental to the economic development than the market failures. Nonetheless, economists advocating free markets suggest that the state should limit its functions to provide an effective legal system and a stable macroeconomic environment. For the latter, the government should involve itself in providing the merit goods and build socio-economic infrastructure leaving the rest for the operation of market forces. Their argument is that market failures are no longer enough to justify the state’s role as there is no guarantee that the state will be able to remove those distortions. In this context, Prof. Paul Streeten observes that just as government action can lead to rent seeking (i.e. grab unearned money), private market players can also collude and seek rent. He, therefore, suggests that the state should be a vigilant watchdog to prevent the rent seeking behaviour in general which itself facilitates the market to function efficiently.

The need for state interventions in the market economy derives from two theories: the *public interest theory* and the *interest group theory*. According to the public interest theory, state's role in the market is to safeguard public interest by addressing the factors of imperfect competition, incomplete information and externalities. These three factors, commonly associated with market economy, necessitate state regulations and controls. The first and foremost role of the state is, therefore, to prevent concentration of market power by promoting competitiveness among economic entities. State intervention is also required because society has not only incomplete access to information but acquiring information may involve more costs than benefits. The state can, therefore, establish well-designed liability rules to protect the consumers in case the quality of products fails to meet the specified standards. For instance, in the absence of government regulations, individual units (e.g. sugar factory) may not treat their solid, liquid and gaseous wastes before releasing them into the environment. In order to internalise the negative externalities from such actions, the government can establish a set of regulations so that the polluters bear the cost of such bad environmental products generated while producing the goods and services. According to the interest group theory, state intervention in the market is required to protect the interest of specific groups or regions. For instance, in order to attract more private investment in energy generation by adopting green and clean sources, the government can provide input subsidies and tax exemptions to promote the investment in alternative sources of energy like solar, wind or bio-energy.

The role of state is, therefore, to remove instances of market failures by creating an enabling environment under which the market can work efficiently. For this purpose, in addition to instituting a set of legally binding rules and regulations, the state has to establish efficient institutions to implement them properly. The recent global economic and financial crisis brings the role of the state back into focus, as unregulated market forces may land the economy in a crisis. In brief, therefore, we can summarize the role of the state in the market economy as follows.

1. The most critical role of the state is to provide economy with a legal structure without which market cannot perform properly. The legal structure comprises of various rules and regulations, including property rights, enforcement of contracts, legislations, etc. Market system works only when the state ensures property rights.
2. Competitive market is required as it provides correct price signals to both the producers and consumers. A competitive market environment must therefore be established by controlling the monopoly power of business entities.
3. The state should strive to protect the welfare of poor and marginalized groups by implementing affirmative policy actions. This is important to reduce inequality in the society.
4. Government's role is also important in making provision for public and quasi-public goods as market generally fails to efficiently deliver these goods. Examples of such public goods are defence, security, police protection and the judicial system whereas education and healthcare services are examples of quasi-public (merit) goods that the market generally under-provides. Provision of these public/quasi-public goods are necessary for promoting the investment required for private goods. However, since government has limited resources, quasi-public/merit goods can also be produced under public-private partnership arrangements.
5. The fifth role of the state is to provide a stable macroeconomic environment for promoting growth with stability in the economy. Fiscal and monetary policies are

instruments used to control inflation/depression in the economy to accelerate the growth process.

- 6. The most critical role of the state, especially in the developing countries, is to reduce poverty and inequality across regions, gender, social groups and sectors thereby facilitating the promotion of a more inclusive and equitable development process. ***This is because economic growth is necessary but not sufficient for equitable development.*** The state, therefore, needs to step-in to create equal opportunities for all sections of society by enhancing the capability of poor and marginalized groups to enable them to actively participate in the market economy.

**Check Your Progress 1** [answer the questions in about 100 words in the space given]

- 1) In what way is the government or state important in a free market economy?  
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- 2) How is a vigilant civil society helpful in making the state and markets function well?  
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- 3) In a free market economy, specifically what role was envisaged for the government by the classical economists?  
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- 4) What are the three factors that generally afflict a market economy in its efficient functioning? How can state intervention help in these?  
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- 5) Do you think economic growth alone is enough for ensuring equitable development? Justify your viewpoint with illustrations.  
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## 1.4 POVERTY

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There are two concepts of poverty— absolute and relative. Absolute poverty refers to the minimum basic needs of human beings, such as, food and nutrition, clothing, shelter and preventive and protective healthcare, necessary for their survival and physical health. In view of this, in developing countries like India, absolute poverty attracts more attention of policy makers than the relative poverty. This approach involves defining a minimum standard of living below which an individual or household is considered to be poor. Based on the income required for maintaining this minimum level of living, a poverty line is estimated. A distinction is then made between the poor and non-poor depending on persons who lie either below or above this defined line of poverty. That is, a household having income level below the subsistence level is termed as poor and above it as non-poor. In India, poverty line is drawn on the basis of per-capita (adult) daily intake of 2,400 calories of food for the rural and 2,100 calories for the urban areas. If the monthly per-capita consumption expenditure (MPCE) of a household is not sufficient to buy this much of calories, then the household is designated as below poverty line (BPL).

For estimating poverty, consumption expenditure is considered more appropriate than income as consumption not only depends on the current income but also on the past savings, accumulated assets and debts. However, this minimum calorie requirement is not static and may change with the change in the nature of work. For instance, recently Planning Commission of India (Tendulkar Expert Group, 2009) estimated the poverty line on less number of calories (than specified above) as people require less calories due to decline in the physical work performed now than before. A later group (Rangarajan Expert Group, 2012) also considered expenditure on education, health, shelter, conveyance, etc. to measure poverty. In view of this, poverty ratios estimated by this group was much higher than that estimated by the preceding group. Thus, absolute poverty indicates the extent of deprivation in terms of access to food, health, housing, education and other basic amenities.

Absolute poverty is not related to the income/consumption distribution whereas relative poverty depends on it. Therefore, measurement of absolute poverty is relevant for short and medium term periods while for long term perspective, it is the relative poverty which is more relevant. A relative poverty line is an explicit function of the income distribution – namely, a constant fraction of some income standard. It interprets poverty in relation to the prevailing standards of the society at the time. Thus, the cut-off below which a household is considered to be relatively poor varies proportionally with the standard of income considered. Therefore, relative poverty line is defined in terms of a certain percentage (say 40 percent) of a country's median or mean level of income. For instance, a household may be called relatively poor if its income is below 40 percent of the national average. Selection of cut-off percentage may vary across time as a certain level of income that is above the poverty line in one income distribution may actually lie below the poverty line considered in another distribution. Thus, the concept of relative poverty is more relevant in developed economies, where the number of absolute poor may be negligible.

### 1.4.1 Measurement of Poverty

There are various methods of measuring poverty. Three major methods of measuring poverty viz. (i) the headcount ratio, (ii) the poverty gap ratio and (iii) the squared poverty gap ratio are discussed here.

### 1.4.1.1 Headcount Ratio

The headcount ratio of measuring poverty is defined as the percentage of the total population that is poor. Thus, it is measured as the proportion of the population that is counted as poor. It is estimated as:

$$P_0 = \frac{N_p}{N}$$

Where  $P_0$  is headcount ratio;  $N_p$  is the number of poor; and  $N$  is the total population. If the monthly per-capita consumption expenditure (MPCE) of 60 million households out of 179 million households of rural India is below the cut-off point, the headcount poverty ratio is  $= 60/179 = 0.3352$ . This means 33.52 percent of rural households in India are below the poverty line. If the value of MPCE (say  $Y_i$ ) in a sample of household is below the poverty line (say  $Z$ ), i.e.  $Y_i < Z$  then the  $i^{\text{th}}$  household is counted as poor. If the value of  $Y_i > Z$ , then the  $i^{\text{th}}$  household is counted as non-poor. Thus, the aggregate value of 'proportion of poor household' by the headcount method ( $P_0$ ) in a region can be represented as:

$$P_0 = \frac{1}{N} \sum_{i=1}^N Y_i \quad (\text{if } Y_i < Z)$$

The above can be illustrated by an empirical example. Suppose the MPCE of 8 households in two regions is as per the values presented in Table 1.1 and the value of  $Z$  i.e. the threshold level of income to regard a family as poor is kept as Rs. 800. Since there are three households in each of the two regions with the MPCE below Rs. 800, the headcount ratio of poverty for the sample households of both the regions I & II, comes out uniformly as 0.375.

**Table 1.1: Poverty Estimates by Headcount Ratio Method**

Region	MPCE (in Rs.) in 8 Sample Households								Headcount Ratio ( $P_0$ ) $Z = \text{Rs. } 800$
	1	2	3	4	5	6	7	8	
Region I	950	1100	1000	975	750	775	790	1400	$3/8 = 0.375$
Region II	1250	1150	1400	1100	550	600	490	1200	$3/8 = 0.375$

Thus, although the headcount ratio is simple to estimate, and therefore widely used to estimate absolute poverty, it has several weaknesses. First, it does not tell us anything about the relative intensity of poverty in the two regions. Second, it does not indicate how poor the poor really are as a slight transfer of income from among the poor families alters the poverty estimate drastically. For instance, if Rs.25 is transferred from household No.7 to household No.6 and Rs.10 from household No. 5 to household No.7, the headcount ratio of poverty in Region I gets reduced from 0.375 to 0.125. Third, the headcount ratio, calculated from household level consumption data, does not capture the discrimination in consumption level across members like, say, by gender. From these weaknesses point of view, the measure of poverty calculated as 'poverty gap ratio' is superior to the headcount ratio.

### 1.4.1.2 Poverty Gap Ratio

For studying the intensity of poverty, estimation of poverty gap ratio is useful. Expressed as a percentage of poverty line, it tells us the extent to which individuals, on average, fall below a poverty line. It is a key indicator that measures how far the extremely poor fall

below the poverty line reflecting both the depth and incidence of poverty. It is estimated as:

$$P_1 = \frac{1}{N} \sum_{i=1}^N \frac{G_i}{Z}$$

Where  $P_1$  is poverty gap index;  $N$ = number of households;  $G_i$  = poverty gap i.e. the difference between the MPCE  $Y_i$  and the level of  $Z$  taken as the minimum income required for basic sustenance. If the value of  $Y_i > Z$ , then  $G_i$  is taken as equal to 0 and if  $Y_i < Z$ , then  $G_i$  is taken as equal to  $Z - Y_i$ . Computation of poverty gap index is shown in Table 1.2. The poverty gap index for Region I (0.0133) is less than that of Region II (0.119) while by the headcount ratio the estimated poverty level was the same for both the regions. Thus, by knowing the poverty gap index, the policy planners can better target the schemes to minimise or eliminate poverty. However, poverty gap index also has limitations. Like the headcount ratio, it also violates Dalton’s transfer principle (see subsequent section 1.5.2) as shown in Table 1.3. In both the regions,  $P_0$  and  $P_1$  are the same whereas apparently the severity of poverty in Region II is more than Region I. Thus, Poverty gap index can give us an idea of intensity of poverty between the regions but cannot provide a measure of the severity of poverty.

**Table 1.2: Poverty Estimates by the Poverty-Gap Ratio Method**

Region	MPCE (in Rs.) in 8 Sample Households								Poverty Gap Index ( $P_1$ )
	1	2	3	4	5	6	7	8	
Region I	950	1100	1000	975	750	775	790	1400	$Z = 800$
$G_i = Z - Y_i$	0	0	0	0	50	25	10	0	
$G_i/Z$	0	0	0	0	0.0625	0.03125	0.0125	0	$0.10625/8 = 0.0133$
Region II	1250	1150	1400	1100	550	600	490	1200	
$G_i = Z - Y_i$	0	0	0	0	250	200	310	0	
$G_i/Z$	0	0	0	0	0.3125	0.25	0.3875	0	$0.95/8 = 0.119$

**Table 1.3: Headcount Ratio and Poverty Gap Ratio in Two Regions**

Region	MPCE (in Rs.) in 7 Sample Households							$Z = \text{Rs. } 800$	
	1	2	3	4	5	6	7	$P_0$	$P_1$
Region I	1200	1100	1000	975	900	700	700	0.286	
$G_i = Z - Y_i$	0	0	0	0	0	100	100		
$G_i/Z$	0	0	0	0	0	0.125	0.125		$0.250 \div 7 = 0.036$
Region II	1200	1150	1400	1100	850	750	650	0.286	
$G_i = Z - Y_i$	0	0	0	0	0	50	150		
$G_i/Z$	0	0	0	0	0	0.0625	0.1875		$0.25 \div 7 = 0.036$

**Note:**  $P_0$  is Headcount Ratio (i.e. no. of households below  $Z \div 7$ ) and  $P_1$  is Poverty Gap Ratio ( $1/7 \sum G_i/Z$ )



### 1.4.1.3 Squared Poverty Gap Ratio

The squared poverty gap ratio, which is similar to the poverty gap ratio discussed above (but for considering the sum of squares of  $G_i/Z$  values), is helpful to know the severity of poverty. As a weighted sum of poverty gaps, where the weights are the proportionate poverty gaps themselves (i.e. a poverty gap of 'x' percent is given equal weight of 'x' percent), it is sensitive to the prevalence of the poor by the extent to which their incomes fall below the poverty line. This is in contrast with the poverty gap ratio method, where the gaps are all weighted equally. Hence, by squaring the poverty gap index, the measure implicitly puts more weight on observations that fall below the poverty line. The Squared Poverty Gap Ratio ( $P_2$ ) is obtained as:

$$P_2 = \frac{1}{N} \sum_{i=1}^N \left( \frac{G_i}{Z} \right)^2.$$

To see the differential impact of  $P_2$  as compared to those of  $P_0$  and  $P_1$  discussed above, let us once again take the same example that was used to calculate  $P_0$  and  $P_1$  (Table 1.4). Since the value of  $P_2$  in Region 2 (0.04) is higher than that for Region 1 (0), as a measure of severity of poverty,  $P_2$  is more sensitive and powerful than the headcount ratio and the equi-weighted poverty gap ratio.

**Table 1.4: Measure of Poverty by the Squared Poverty Gap Ratio**

Region	MPCE (in Rs.) in 8 Sample Households								Squared Poverty Gap Ratio ( $P_2$ )
	1	2	3	4	5	6	7	8	
Region I	950	1100	1000	975	750	775	790	1400	$Z = 800$
$G_i = Z - Y_i$	0	0	0	0	50	25	10	0	
$G_i/Z$	0	0	0	0	0.0625	0.03125	0.0125	0	
$(G_i/Z)^2$	0	0	0	0	0.0039	0.0010	0.0002	0	$1/8 \sum (G_i/Z)^2 = 1/8 * 0.0051 = 0.00064 \approx 0$
Region II	1250	1150	1400	1100	550	600	490	1200	
$G_i = Z - Y_i$	0	0	0	0	250	200	310	0	
$G_i/Z$	0	0	0	0	0.3125	0.25	0.3875	0	
$(G_i/Z)^2$	0	0	0	0	0.0977	0.0625	0.1502		$1/8 \sum (G_i/Z)^2 = 1/8 * 0.3104 = 0.0388 \approx 0.04$

### 1.4.2 Multidimensional Concept of Poverty

The discussion in the preceding sub-sections is of uni-dimensional concept of poverty and its methods of measurement. However, poverty is multi-dimensional in nature and hence cannot be realistically captured only by the calorie-based or the per-capita consumption based approach. In measuring multidimensional poverty, various dimensions and indicators like education, health, employment status and household living conditions are used. Further, some of these dimensions may have more than one indicator. For instance, education dimension can consist of school enrolment and years of schooling. Likewise, household living conditions may comprise of access to safe drinking water, sanitation and clean cooking fuel, etc.

The Oxford Poverty and Human Development Initiative (OPHI) estimates the multi-dimensional poverty index (MPI) for different countries, using equally weighted three dimensions viz. education, health and living standards. However, for capturing these three dimensions it uses a total of 10 indicators. Specifically, for the ‘education dimension’ it uses two indicators: (i) years of schooling (considered deprived if no household member has completed five years of schooling); and (ii) school attendance (considered deprived if any school-aged child is not attending school in years 1 to 8). For the ‘health dimension’ also it considers two indicators: (i) child mortality (considered deprived if any child in the family has died); and (ii) nutrition (considered deprived if any adult or child is malnourished). For the ‘living standards’ dimension it considers six indicators viz. (i) electricity (deprived if the household has no electricity); (ii) drinking water (deprived if the household lacks access to clean drinking water or clean water is more than a 30-minute walk from home); (iii) sanitation (deprived if the household does not have adequate sanitation or has shared toilet; (iv) flooring (deprived if the household has a dirt, sand or dung floor); (v) cooking fuel (deprived if the household cooks with wood, charcoal or dung); and (vi) assets (deprived if the household does not own more than one of items radio, TV, telephone, bike, motorbike, or refrigerator) and does not own a car or tractor. A person is identified as multi-dimensional poor if he/she is deprived in one-third or more of these ten weighted indicators.

The headcount ratio can also be used to measure multi-dimensional poverty if we take the proportion of poor (q) in population (n) as those who are multidimensional poor. The multi-dimensional poverty ‘H’ is computed as:

$$H = \frac{q}{n}$$

where ‘q’ is number of multidimensional poor and ‘n’ the total population. The intensity of poverty (A) or the breadth of deprivation, which captures the average weighted count of deprivations experienced by the multidimensional poor. The intensity of poverty (A) is computed as:

$$A = \frac{\sum_1^q c}{q}$$

where ‘c’ is the total weighted deprivations experienced by the poor. The multidimensional poverty index (MPI) is the product of headcount ratio (H) and the intensity of poverty (A). The MPI is computed as:

$$MPI = H \times A$$

Alkire and Seth (2013) estimate the MPI for India using national family health survey (NFHS) data for 1998-99 and 2005-06 (Table 1.5). Their estimates show that the MPI declined from 0.300 to 0.251 (i.e. a net decline of 16 percent). The decrease was mainly due to a reduction in the percentage of people identified as poor (H) and reduction in the intensity of poverty (A).

**Table 1.5: Multi-dimensional Poverty in India – 1999 and 2006)**

H/A/MPI	Rural			Urban			Total		
	1999	2006	%Change	1999	2006	Change	1999	2006	% Change
H (%)	68.6	60.8	7.8	24.4	20.5	3.9	56.8	48.5	-8.3
A (%)	53.6	52.4	1.2	47.4	46.5	0.90	52.9	51.7	-1.2
MPI	0.368	0.319	0.049	0.116	0.096	0.02	0.300	0.251	-0.05

**Source:** Alkire and Seth (2013).

**Note:** MPI for the years 1999 and 2006 is arrived at by multiplying H with A in value without percents (e.g. 0.686 x 0.536 = 0.368). MPI can also be indicated as percentages by multiplying their value by 100 (e.g. 36.8% for rural in 1999). The computational requirements of H and A is outlined in the source cited.

### 1.4.3 Axioms of Poverty Measures

Nobel laureate Amartya Sen suggested a number of desirable properties (or axioms) that any measure of poverty should possess. The six axioms proposed by him as required for any poverty measure to possess are the following.

1. **Focus:** The measure of poverty should not be affected by changes in the incomes of non-poor. In other words, the poverty measure should entirely focus on the incomes of the poor as the poverty ratio is not affected by the income of the households above the poverty line.
2. **Symmetry:** The poverty measure should not be affected if two households switch incomes i.e. the poverty index should be scale invariant. This means that if the population doubles in size, while everything else is maintained in the same proportions, it should remain unchanged.
3. **Population Independence:** If two or more identical populations are pooled, the poverty index should be unchanged. In other words, the index should be invariable with the replication and pooling of identical populations.
4. **Monotonicity:** The axiom requires that if the income of a poor individual who is below the poverty line increases, the poverty index should decrease. The monotonicity is said to be strong (i.e. 'strong monotonicity' or SM) if the poverty index decreases whenever the income of a poor individual rises. The weak monotonicity (WM) axiom requires that the poverty index should decrease whenever the income of the poor individual rises but the individual continues to remain poor. The distinguishing feature between the SM and WM is that 'while WM requires the poverty index to decrease only if the poor individual is not lifted out of poverty after the increase in income, the SM requires the index to decrease even in the case when the poor household is lifted out of poverty with the increase in income'. Thus, SM implies WM.
5. **Transfer:** A regressive transfer between two poor households should increase the poverty index, while a progressive transfer between the two should reduce the poverty index, provided both the households continue to be poor after the transfer i.e. a poverty measure should be sensitive to the degree of inequality between the incomes of the poor households. It should rise when inequality among them increases (through a regressive transfer) and it should fall when it decreases (through a progressive transfer).

**Check Your Progress 2** [answer the questions in about 100 words in the space given]

- 1) What criteria is used for classifying a family as poor or non-poor in India?  
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- 2) How is absolute poverty defined? What components of expenditure are included in its measurement?  
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- 3) In what way is 'relative poverty' different from 'absolute poverty'?
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- 4) How is the 'headcount measure' of poverty defined? What are its strengths and weaknesses?
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- 5) How is the measure of poverty provided by the 'poverty gap ratio' superior to that of 'headcount ratio' method? How is it estimated?
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- 6) In what way 'squared poverty gap ratio' method of measuring poverty superior to the 'poverty gap ratio' method? How is it computed?
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- 7) Can the 'headcount ratio' of measuring poverty be useful for computing a 'multi-dimensional poverty index'? Indicate with relevant expressions how a MPI brings out the 'intensity of poverty' or deprivations.
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- 8) Distinguish between the strong and the weak monotonicity requirement of an ideal poverty measure.
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## 1.5 INEQUALITY

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Income inequality obstructs the process of poverty reduction thereby weakening the very pace of economic growth. It affects the human capital formation as those at the bottom of income pyramid face severe economic constraints in investing in education and health which in turn limits their income earning potential. In addition, it can also create political instability and weaken the institutional framework of a country.

From a public policy point of view, therefore, it is necessary to differentiate between inequality of opportunities and inequality of outcomes. Inequality of opportunities exist in any society due to differences in individual circumstances that are beyond the control of individual, such as gender, caste, location of birth, parental education, etc. Such inequalities reflect the institutional weaknesses and social exclusion and are to be targeted through affirmative policy actions. Inequality of outcome basically exists due to differences in the individual efforts in availing the opportunities. While some inequality in outcome is part of the normal functioning of a market economy, a substantial component of inequality reflects the inequality of opportunities itself. For instance, children of illiterate parents may not educate their children due to family/economic circumstances.

The role of the state is quite significant in reducing the inequalities across sectors, location, gender and social groups by designing a set of policy responses which reduce the inequality of opportunities. Such policy responses must aim at building the human capital to make the growth process more inclusive and employment-oriented. In particular, the human capital base of marginalised group can be enhanced by investing more in improving their level of education and health, providing effective social safety-net and creating productive income and employment opportunities.

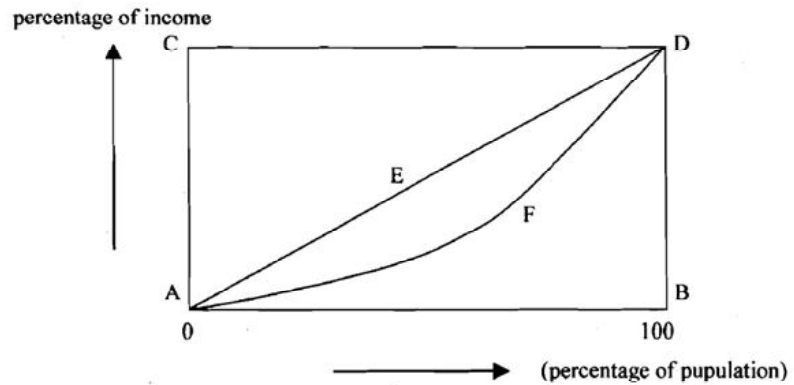
### 1.5.1 Methods of Inequality Measurement

Like poverty, inequality is also multi-dimensional in nature as various dimensions of inequality are interrelated. For instance, inequality in income and wealth among group of people also creates inequality in other dimensions of living standards like food and nutrition, shelter, access to basic amenities, education, health, material well-being, etc. Income inequality measures the relative position of different households within an income distribution. Unlike the absolute poverty measure, inequality measure is not affected by the absolute number of households since it measures the relative position of a household in the distribution. Level of inequality can be reduced by transferring income from high income groups to low income groups. Some important inequality measures are the following.

#### 1.5.1.1 Lorenz Curve

The Lorenz Curve first ranks the population according to different levels of consumption/income and then plots the cumulative proportion of consumption/income against the cumulative proportion of the population enjoying that level of consumption/income (Figure 1.1). The area between the Lorenz curve and the 45 degree diagonal line (which is called the line of equality) i.e. AEDF, divided by the total area under the 45 degree line (i.e. AEDB) gives a measure of inequality (called as the Gini coefficient discussed in next section). While the concepts of Lorenz curves and Gini coefficients are most commonly applied to measures of consumption, income and asset ownership, they can equally be applied to other variables that are continuous in nature. If we refer the curve AEDF plotted as  $L(p)$ , where the lowest 'p' percent of households earn the lowest 'p' percent of income, it follows that greater the share of 'p', the more equal is the distribution of income in the economy. Alternatively, since the share of the total income of the

richest ‘p’ proportion of the population is then given by ‘1 – L(p)’, the greater is this share, the more unequal is the distribution of income in the economy. The Lorenz curve typically falls below the line of equality with the total amount of inequality given by the area AEDF. The larger is this area, greater is the inequality.



**Figure 1.1: The Lorenz Curve**

For an illustration of plotting the Lorenz Curve, we can consider a hypothetical sample of 10 individuals having their income as shown in Table 1.6. First, we sort the observations (individuals) in ascending order of income (column 3: the lowest income being 4000 of the individual in Sl. No. 7 being listed first & so on) and rewrite the income of individuals to appear in the ascending order (in column 4). Summing over all incomes, we obtain the sample *aggregate* income of Rs. 73550. We assume each individual to have a population share of 1/10 i.e. 10 percent (P) and cumulate the proportions successively as in column 5 (i.e. the total sample is distributed into 10 quintiles). We then cumulate the income in column 4 to get the figures in column 6 and obtain their percentage share in the total income (73550) as in column 7. By plotting the percentage share in total income in column 7 on Y-axis and the cumulative percentage distribution of population (figures in column 5) on X-axis, we get the Lorenz Curve. It is thus a function of cumulative proportion of ordered individuals mapped onto the corresponding cumulative proportion of their income.

**Table 1.6: Illustrated Calculations for Plotting Lorenz Curve for an Income Distribution of 10 Households**

Individual/ Household	Income (Rs.)	Individuals Sorted by Ascending order of Income	Income of Households in the Re- Ordered Households	Cumulative % of Population (P)	Cumulative Income	% Share in Total Income L(P)
1	5000	7	4000	10	4000	5.44
2	6500	5	4500	20	8500	11.56
3	9050	1	5000	30	13500	18.35
4	11500	2	6500	40	20000	27.19
5	4500	9	6500	50	26500	36.03
6	8500	8	7500	60	34000	46.23
7	4000	6	8500	70	42500	57.78
8	7500	3	9050	80	51550	70.09
9	6500	10	10500	90	62050	84.36
10	10500	4	11500	100	73550	100.00
<b>Total Income</b>	<b>73550</b>		<b>73550</b>			

### 1.5.1.2 Gini Coefficient

Developed by Italian statistician Corrado Gini (1912), Gini coefficient is the widely used method to measure income and consumption inequalities. It is used to measure the degree of concentration in the inequality of a variable in a distribution of its elements. With its values ranging between 0 and 1, it assumes a value of zero when there is perfect equality in society. On the other hand, it takes the theoretical maximum of 1 when in a population the income level of every individual except one is zero. The Gini-coefficient thus gives a summary figure for Lorenz curve. It is given by the ratio of area below the line of equality in the Lorenz curve to the total area of the triangle ABD in Figure 1.1. As said above, the Gini Coefficient (G) is calculated as:  $G = \frac{\text{area AEDF}}{\text{area AEDB}}$ . Since the Gini coefficient lies between zero and one, the inequality increases as the index moves from zero to one. In empirical exercises, the Gini-coefficient is calculated by the formula:

$$G = \frac{1}{n} \left[ n + 1 - 2 \left( \frac{\sum_{i=1}^n (n + 1 - i) Y_i}{\sum_{i=1}^n Y_i} \right) \right]$$

**Table 1.7: Computation of Gini Coefficient**

Reordered Household	Income (Y <sub>i</sub> )	Row Number (i)	n+1-i	(n+1-i)Y <sub>i</sub>
7	4000	1	10	40000
5	4500	2	9	40500
1	5000	3	8	40000
2	6500	4	7	45500
9	6500	5	6	39000
8	7500	6	5	37500
6	8500	7	4	34000
3	9050	8	3	27150
10	10500	9	2	21000
4	11500	10	1	11500
<b>Sum</b>	<b>73550</b>			<b>336150</b>

or,

$$G = \left[ \frac{(n + 1)}{n} - \frac{2}{n} \left( \frac{\sum_{i=1}^n (n + 1 - i) Y_i}{\sum_{i=1}^n Y_i} \right) \right]$$

where n is the number of individuals and Y<sub>i</sub> is the income of the individual occupying the i<sup>th</sup> row of the sorted income data in Table 1.6. The income of the poorest individual is Y<sub>1</sub> and that of the richest is Y<sub>10</sub>. The calculation of the Gini is illustrated in Table 1.7 above. The Gini coefficient G is:

$$G = \left[ \frac{(10 + 1)}{10} - \frac{2}{10} \left( \frac{336150}{73550} \right) \right] = 0.186$$

While comparing the same for two or more regions, a lower Gini indicates a higher level of social or economic inequality.

Many other inequality indices have been developed, and some of these have additional desirable properties not satisfied by the Gini coefficient. One such important index is

the Theil index (on which you will study more in the course MEC 009/109 on Research Methods in Economics). Different inequality indices implicitly represent different value judgments, notably on the relative weight to be given to different parts of the distribution. For instance, the simplest way to measure inequality is by dividing the population into five quintiles – from poorest to richest and calculating the proportions of income (or expenditure) that accrue to each level.

### 1.5.2 Axioms of Inequality Measures

There are five key axioms of inequality measures viz. (i) the principle of transfers; (ii) the principle of population; (iii) the principle of scale invariance; (iv) the principle of translation invariance; and (v) decomposability.

1. The principle of transfers, also known as the Pigou-Dalton principle of transfers, requires that the inequality index should fall with a progressive transfer (i.e. an income transfer from richer to poorer households) and should increase with a regressive transfer (i.e. an income transfer from poorer to richer households).
2. The principle of population requires the inequality index to be invariant to replications of the original population i.e. if the population were to change, the measure of inequality should not change.
3. The principle of 'scale invariance' requires that if income of all households is scaled up or down by the same factor, then the inequality measure should remain unchanged. This ensures that the inequality is a purely relative concept and is independent of the distribution size.
4. The principle of 'translation invariance' requires the inequality index to be invariant to uniform additions or subtractions to original incomes (i.e. invariant to change of 'origin' in the values of income). For example, if Rs. 100 is added (or subtracted) uniformly in the income of all households in the distribution, inequality index should remain unchanged.
5. The axiom of decomposability ensures that inequality may be decomposed by population groups or income sources or in any other dimension. This axiom requires a consistent relation between overall inequality and its parts.

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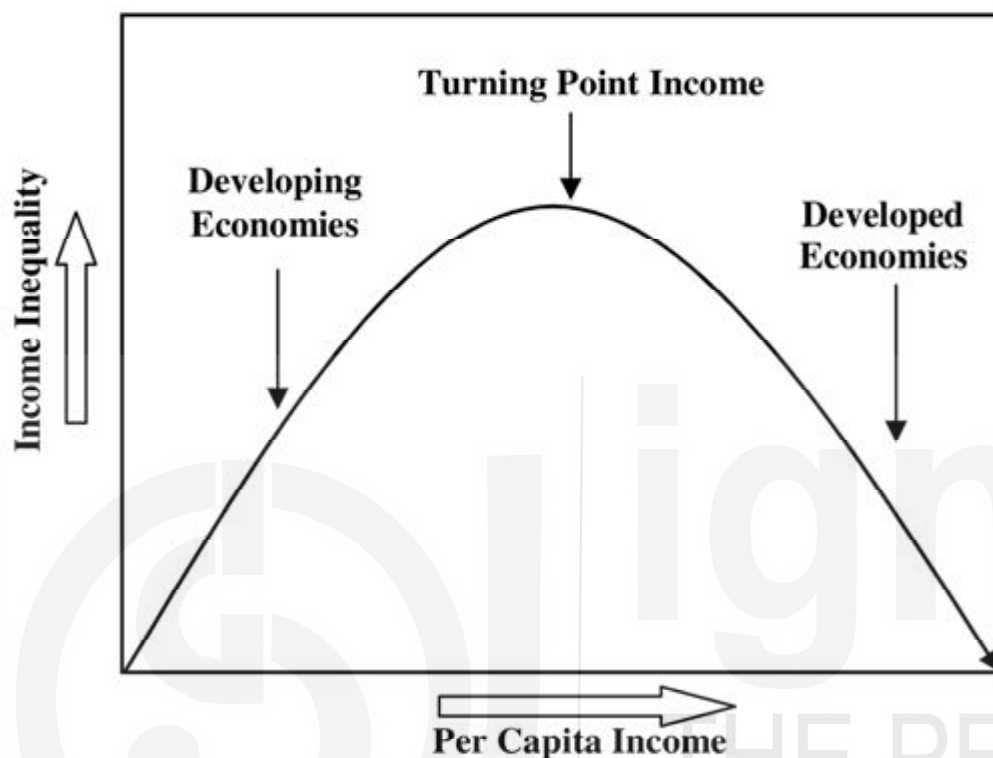
## 1.6 INEQUALITY AND ECONOMIC GROWTH (THE INVERTED-U HYPOTHESIS)

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Developed by Simon Kuznets in 1955, the inverted U-hypothesis states that the economic inequality increases with the increase in economic growth in the initial phase of development but after the economy reaches a particular level of development, the inequality starts falling with the increase in level of economic growth. According to this hypothesis, the income inequality follows an inverted-U shape along the stages of economic development i.e. it first rises with the growth of industrialization but declines later due to more and more workers joining high productivity sectors of the economy. Changing sectoral composition of employment and income, and changes in the level of human capital and technical progress at different stages of development, are considered the main reasons for this inverse-U relationship between inequality and economic growth in the economy. The hypothesis explains that initially, the inequality increases with the increase in per capita income, which may happen due to the movement of workers from the low productive sector (say agriculture) to high productive sector (say industry) and increase in physical capital. That is, initially, the investment in physical capital acts as the driver of growth and, therefore, those who save and invest realise more income. Thus, industrialization benefits limited number of people, especially those who possess



financial endowments and entrepreneurial skills. Technical progress is also likely to have a more uneven character at low levels of income as it is initially biased against unskilled labour tending to drive down their wages. But in later stages, gains of changing composition of the economy would spread over larger number of people as increased demand for workers improves their wages and consequently they can invest more in human capital. Therefore, in later stages, human capital accumulation takes over the physical capital accumulation thereby becoming the main engine of growth.



**Figure 1.2: The Inverted-U Hypothesis**

Using the ratio of the income share of the richest 20 percent of the population to that of the poorest 60 percent of the population, Kuznets established that between 1913 and 1948, income inequality declined in the United States of America. The hypothesis can be tested by using cross-sectional and time series data to get an idea of income inequalities across regions/countries. Using time series data, we can study the income inequality in a region/country over time. Kuznets curve is extended to study the relationship between environmental degradation and economic development. The environmental Kuznets curve shows that in the early stages of economic growth there is an increase in environmental degradation and pollution, but beyond some level of per capita income, the trend reverses.

Income inequalities in the developed as well as emerging economies have increased in recent years. The hypothesis has, therefore, important policy implications. Since inequality and poverty result in poor quality of health, nutrition, education and level of living, it has the potential to create social and political conflicts. This would adversely affect the future development potentials of a country.

## **1.7 POST-REFORM POVERTY TRENDS IN INDIA**

Various Task Forces/Expert Groups have been constituted by the Government of India from time to time to estimate poverty (e.g. Alagh, 1977; Lakdawala, 1989; Tendulkar, 2005; Rangarajan, 2012). There have been improvements in the methodology of

estimation over the period. Table 1.8 presents a comparative profile of the poverty estimates provided by the most recently constituted Tendulkar and Rangarajan Expert Groups. The former used the all-India urban poverty line basket as the reference to derive the state-level (rural and urban) poverty estimates. This was a departure from the earlier practice of using two separate poverty line baskets for rural and urban areas. The Rangarajan Group reverted to the practice of having separate all-India rural and urban poverty basket lines for deriving the state-level rural and urban estimates. It also considered certain non-food expenditures like expenditure on shelter, education, clothing, conveyance and a behaviourally determined level of other non-food expenses. Since it is difficult to set minimum norms for these essential non-food items, the group recommended that observed expenditures on these items by households located in the median fractile (45-50 percentile) be treated as the normative minimum private consumption expenditure on these items. For all other non-food goods and services, the observed expenditure of that fractile-class meeting the nutrient-norms (of the 25<sup>th</sup> to 30<sup>th</sup> percentile in rural India, and the 15<sup>th</sup> to 20<sup>th</sup> percentile in urban India) was taken to define the poverty line basket in respect of these items. The group, therefore, estimated the MPCE of Rs. 972 for rural areas and Rs. 1407 for urban areas to constitute the poverty lines at the all- India level for 2011-12.

It is thus clear that the methodology used by the Rangarajan group is an improvement over that of the Tendulkar group as it includes both food and essential non-food items in the MPCE to measure poverty. As Table 1.8 below indicates, the poverty estimation by the Rangarajan group is higher than that of the Tendulkar Group. Since poverty is a multi-dimensional concept, inclusion of some non-food items in the poverty estimation is a step towards the computation of multi-dimensional poverty in India.

**Table 1.8: Percentage and Number of Estimated Poor**

Year	Poverty Ratio (Percent)			Number of Poor (Million)		
	Rural	Urban	Total	Rural	Urban	Total
<b>Tendulkar Group (2009)</b>						
1993-94	50.1	31.8	45.3	328.6	74.5	403.7
2004-05	41.8	25.7	37.2	326.3	80.8	407.1
2009-10	33.8	20.9	29.8	278.2	76.5	354.7
2011-12	25.7	13.7	21.9	216.7	53.1	269.8
<b>Rangarajan Group (2014)</b>						
2009-10	39.6	35.1	38.2	325.9	128.7	454.6
2011-12	30.9	26.4	29.5	260.5	102.5	363.0

**Source:** Planning Commission, 2009 & 2014.

**Check Your Progress 3** [answer the questions in about 100 words in the space given]

- 1) Distinguish between ‘inequality of opportunities’ and ‘inequality of outcomes’. What is the role of government in reducing the inequality in societies?

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- 2) Do you think, like poverty, inequality too is multi-dimensional? Why? What is an essential difference between the two (i.e. poverty and inequality)?

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- 3) With the help of the standard diagram for plotting the Lorenz Curve, identify the conditions under which 'greater equality' and 'greater inequality' would prevail in an economy.

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- 4) What does 'Gini coefficient' basically measure? In what way this coefficient and the Lorenz curve are related? How is Gini coefficient measured in empirical exercises?

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- 5) What is meant by 'Pigou-Dalton principle of transfers' in the context of an inequality index?

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- 6) How does the Kuznets' 'inverted-U hypothesis' characterise the relationship between 'economic growth' and 'economic inequality'? What are the main reasons attributed for this trend? What are the policy implications of this hypothesis?

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- 7) What are the basic differences in the methodological framework adopted by the two most recent Expert Groups constituted to provide estimates of poverty in India? Which one of the two is better and why?

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## 1.8 LET US SUM UP

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The unit outlines the circumstances under which government's intervention is absolutely required under conditions of market economy. Two specific situations discussed in this context are poverty and inequality, both of which would act as severe constraints in the path of growth and development in a society. Various techniques of measurement of both are discussed in the unit. Kuznets's hypothesis which suggests that inequality, in the process of growth, would initially rise but subsequently declines is then discussed. The unit ends by presenting the post-reform poverty trends in India.

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## 1.9 KEY WORDS

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### Poverty

: Refers to a lack of access to minimum standard of living in a society. Poverty can be either absolute or relative. Absolute poverty refers to the minimum basic needs of human beings, such as, food and nutrition, clothing, shelter and preventive and protective healthcare, necessary for their survival and physical health. Relative poverty is talked of in terms of a 'poverty line' which is an explicit function of the income distribution – namely, a constant fraction of some income standard. It interprets poverty in relation to the prevailing standards of the society at the time.

### Poverty Line

: The poverty line is a monetary measure of the minimum consumption of goods and services that a household should obtain in order to ensure that its basic needs are adequately met.

### Poverty Gap

: It is the average of the differences between the income of each individual poor and the poverty line. It measures the total amount of income necessary to raise everyone who is below the poverty line up to that line.

### Inequality

: Represents a situation where income is not distributed equally amongst people. Like poverty, inequality also has two dimensions: inequality of opportunities and inequality of outcomes. The former exist in any society due to differences in individual circumstances that are beyond the control of individual (e.g. gender, caste, parental education, etc.). Such inequalities reflect the institutional weaknesses and social exclusion and are to be targeted through affirmative policy actions. Inequality of outcome exists due to differences in the individual efforts in availing the opportunities.

### Kuznets' Curve

: Represents a hypothesis which argues that in the initial phase of economic growth, inequalities will rise but subsequently declines.

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## **1.10 SUGGESTED REFERENCES FOR FURTHER READING**

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1. Planning Commission (2009), Report of the Expert Group to Review the Methodology for Estimation of Poverty, Government of India, New Delhi.
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4. Sen, A. (1997), On Economic Inequality, New York, Oxford University Press.
5. Haughton J. and Khandker, S.R. (2009), Handbook on Poverty and Inequality, World Bank, Washington, DC.

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## **1.11 ANSWERS/HINTS TO CHECK YOUR PROGRESS QUESTIONS**

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### **Check Your Progress 1**

- 1) See 1.2 and answer.
- 2) See 1.2 and answer.
- 3) See 1.3 and answer.
- 4) See 1.3 and answer..
- 5) See 1.3 and answer.

### **Check Your Progress 2**

- 1) See 1.4 and answer.
- 2) See 1.4 and answer.
- 3) See 1.4 and answer.
- 4) See 1.4.1.1 and answer.
- 5) See 1.4.1.2 and answer.
- 6) See 1.4.1.3 and answer.
- 7) See 1.4.2 and answer.
- 8) See 1.4.3 and answer.

### **Check Your Progress 3**

- 1) See 1.5 and answer.
- 2) See 1.5.1 and answer.
- 3) See 1.5.1.1 and answer.
- 4) See 1.5.1.2 and answer.
- 5) See 1.5.2 and answer.
- 6) See 1.6 and answer.
- 7) See 1.7 and answer.