Interdisciplinary Course (IDC) Elementary Economics (ECON-H-IDC-1/2/3-Th) Marks: 50 by Dr. Bishan Sanyal, Associate Professor in Economics, NHLPC

3.1 Growth vs. Development

Growth is a measurable attribute of your child, such as their height and weight. Development is both qualitative and quantitative. It is both, as development can involve ideas such as intelligent quotient (IQ), which can be quantified as a numerical value, but is nonetheless an arbitrary measurement of something qualitative, the cognitive ability.

We can refer a famous comedy scene of the film 'Namak Halal' where Om Prakash, Daddu of Amitabh Bachchan raised concern about Amitabh's future telling 'Na jane tu apne payer par kab khara hoga'. Amitabh promptly stood up on his legs in front of his Daddu and replied that 'Daddu, dekho mai apne payer par khara ho gaya.' Here, Amitabh emphasised on growth of himself as a human being but his Daddu Om Prakash was indicating about development of Amitabh.

Economic growth refers to increases in a country's production or income per

capita . Production is usually measured by **gross national product** (GNP)

or **gross national income** (GNI), used interchangeably, an economy's total output

of goods and services. **Economic development** refers to economic growth accompanied

by changes in output distribution and economic structure. These changes may include an improvement in the material well-being of the poorer half of the

population; a decline in agriculture's share of GNP and a corresponding increase in

the GNP share of industry and services; an increase in the education and skills of

the labor force; and substantial technical advances originating within the country.

As with children, growth involves a stress on quantitative measures (height or GNP),

whereas development draws attention to changes in capacities (such as physical coordination and learning ability, or the economy's ability to adapt to shifts in tastes and technology).

Economic Growth:

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

Economic Growth implies a process of increase in National Income and Per-Capita Income. The increase in Per-Capita income is the better measure of Economic Growth since it reflects increase in the improvement of living standards of masses.

Economic Growth is measured by increase in real National Income and not just the increase in money income or the nominal national income. In other words the increase should be in terms of increase of output of goods and services, and not due to a mere increase in the market prices of existing goods.

Increase in Real Income should be Over a Long Period: The increase of real national income and per-capita income should be sustained over a long period of time. The short-run seasonal or temporary increases in income should not be confused with economic growth.

Increase in income should be based on Increase in Productive Capacity: Increase in Income can be sustained only when this increase results from some durable increase in productive capacity of the economy like modernization or use of new technology in production, strengthening of infrastructure like transport network, improved electricity generation etc.

Assume that in 2003, GNI for India is Rs. (rupees) 25,000 billion and its population 1067 mil lion, so that **GNI per capita** is Rs. 23,430. The GNI in 2004, Rs. 31,533 billion, must be divided by the **GNI price deflator**, 110 (corresponding to an annual inflation rate of 10 percent) to give a GNI of Rs. 26,866 billion at constant (2003) prices. This figure, divided by the population in 2004, 1085.5 million, nets a GNI per capita of Rs. 24,750. **Real economic growth** (growth in GNI per capita) from 2003 to 2004 is (if expressed in 2003 constant prices) (24,750 − 23,430/23,430) × 100 = 5.6 percent. This growth rate is used by such organizations as the World Bank for average annual growth rate, 2003–04. At a 2004 exchange rate of Rs. 50 = $1, India's GNP per capita of Rs. 29,049 is US$580 (at 2004 prices), used by the World Bank as GNI per capita.We need to adjust nominal GNI per capita by using the PPP exchange rate, that rate at which the goods and services comprising the GNI cost the same in both India and the United States. Using P = 6.13, the price level of GNI or purchasing power adjusted GNI, gives PPP$3,555 per capita, a more accurate indication of the average Indian's purchasing power expressed in U.S. dollar terms.

It was widespread, even though economic growth exceeded the UN target. In 1969,

Dudley Seers signaled this shift by asking the following questions about a country's development:

What has been happening to poverty? What has been happening to unemployment?

What has been happening to inequality? If all three of these have become less severe,

then beyond doubt this has been a period of development for the country concerned.

If one or two of these central problems have been growing worse, especially if all

three have, it would be strange to call the result "development," even if per capita

income has soared. (Seers 1969:3–4)

At the U.N. Millennium Summit in September 2000, world leaders adopted the

Millennium Development Goals (MDGs), setting "targets for reducing poverty,

hunger, disease, illiteracy, environmental degradation, and discrimination against

women" (U.N. Development Program 2000). The project is directed by Columbia

University's Jeffrey Sachs, with advice from senior representatives from U.N. agencies and an International Advisory Panel, with independent experts in relevant fields, supported by the research of thematically-orientated task forces.

The MDGs, using 1990 as a benchmark, set targets for 2015. The targets include

1. reducing the people suffering from hunger and living on less than a dollar a day

from one of six billion (17 percent) to half that proportion;

According to the U.N. Development Program (2003:2–3) and the World Bank (2003h:58–60), the

$1/day poverty rate for 2000 was 17 percent. Two economists contend that theWorld Bank's approach

is flawed methodologically, thus overstating poverty. Surjit Bhalla's (2002:150) estimates poverty at

13 percent. If we use Xavier Sala-i-Martin's (2002:34–42) estimate of 7 percent, the world already

reached the MDG target in the late 1990s (Chapter 6).

2. ensuring that all boys and girls complete primary school (at present, 113 million children do not attend school);

3. promoting gender equality and empowering women by eliminating gender disparities

in primary and secondary education by 2005, and at all levels by 2015

(at present, two-thirds of illiterates are women);

4. reducing by two-thirds mortality among children under five years (presently 11 million children die before their fifth birthday, mainly from preventable illnesses);

5. reducing the percentage of women dying in childbirth by three-fourths (now one in 48 die in childbirth, despite the fact that virtually all countries have safe programs for mothers);

6. halting and reversing the spread of HIV/AIDS, malaria, tuberculosis, and other diseases (at present, 40 million people live with HIV, including five million newly infected in 2001, despite the fact that Brazil, Senegal, Thailand, and Uganda show that the spread of HIV can be stemmed);

7. ensuring environmental sustainability, by reversing the loss of environmental resources, reducing by half the proportion of people without access to safe drinking water by 2015, and achieving significant improvement in the lives of at least 100 million slum dwellers (now "more than one billion people lack access to safe drinking water and more than two billion lack sanitation"); and

8. developing a global partnership for development, including an open trading and financial system, a commitment to good governance, reducing the debt burden of developing countries, reducing the poverty of least developed countries, providing productive employment for youth, providing access to affordable essential drugs in developing countries, and making available the benefits of new technologies, especially in telecommunications (U.N. Development Program 2002b).

Economic Development

Economic development is defined as a sustained improvement in material well being of society. Economic development is a wider concept than economic growth. Apart from growth of national income, it includes changes - social, cultural, political as well as economic which contribute to material progress. It contains changes in resource supplies, in the rate of capital formation, in size and composition of population, in technology, skills and efficiency, in institutional and organizational set-up. These changes fulfill the wider

objectives of ensuring more equitable income distribution, greater employment and poverty alleviation. In short, economic development is a process consisting of a long chain of interrelated changes in fundamental factors of supply and in the structure of demand, leading to a rise in the net national product of a country in the long run.

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

The comparison between the two concepts is given in the following table:

	Economic Growth	Economic development
Meaning	Economic growth refers to an increase in the real output of goods and services in the country.	Economic development implies changes in income, savings and investment along with progressive changes in socioeconomic structure of country (institutional and technological changes).
Factors	Growth relates to a gradual increase in one of the components of Gross Domestic Product: consumption,	Development relates to growth of human capital, decrease in inequality figures, and structural changes that improve

	government spending, investment, net exports.	the quality of life of the population.
Measurement	Economic Growth is measured by quantitative factors such as increase in real GDP or per capita income	The qualitative measures such as HDI (Human Development Index), gender- related index, Human poverty index (HPI), infant mortality, literacy rate etc. are used to measure economic development.
Effect	Economic growth brings quantitative changes in the economy	Economic Development leads to qualitative as well as quantitative changes in the economy.
Relevance	Economic growth reflects the growth of national or per capita income.	Economic development reflects progress in the quality of life in a country.

Sustainable Development

Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Sustainable development includes the protection of future economic growth and future development. In other words, it means a better quality of life for everyone, now and for generations to come.Sustainable development includes the protection of future economic growth and future development. Growth is essential, but sustainable development requires it to be different. It must become more concerned about the physical environment not only to

present generation, but to the future generation also. It means that the current consumption cannot be financed for long by increasing economic debt and ecological imbalance which future generation will pay.Sustainable development constantly seeks to achieve social and economic progress in ways that will not exhaust the earth's finite natural resources. Sustainable development is a process of development in which economic and other policies are designed to bring about development which is economically, socially and ecologically sustainable. The concept thus is pro-people, pro-job and pronature. It gives highest priority to poverty reduction, productive employment, social integration and environmental regeneration. The sustainable development thus requires z Preservation of Ecological Resources and greater use of renewable resources. z Encouragement to the use of environmentally-safe technologies for development purposes i.e. focus on reduction of all kinds of pollution involved in the economic activities. z Formulation and implementation of policy framework for people-security and human justice, including ecological and economic security.

Human Development:

According to the United Nation's Development Programme (UNDP), human development may be defined as "a process of enlarging people's choices." At all levels of development, the three essential choices for people include to live a long and healthy life, to acquire better knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not available, many other opportunities to improve the quality of life will remain inaccessible. Human development has two dimensions: acquiring human capabilities and the use.

of these acquired capabilities for productive, leisure and other purposes. The benefits of human development go far beyond the expansion of income and wealth accumulation because people constitute the very essence of human development. Human development is about much more than economic growth. The economic growth focuses on the improvement of one option i.e. income or product while human development focus on enlarging all human options including education, health, clean environment and material well being. Thus, the options available for

improving people's lives are influenced by the quality of economic growth in its wider sense, and the impact is by no means confined to quantitative aspects of such growth. In other words, economic growth needs to be seen as a means, albeit an important one, and not the ultimate goal, of development. Income makes an important contribution to human well-being, broadly conceived, if its benefits are translated into more fulfilled human lives. But the growth of income is not an end in itself. It is the quality of growth, not its quantity alone, which is crucial for human well-being. Thus, the concept of human development, is concerned mainly with enabling people to enjoy a better life as the ultimate goal of human endeavor. Highlights that this goal cannot be achieved solely through improvements in income or material well-being. As the 1996 Human Development Report put it, growth can be jobless, rather than job creating; ruthless, rather than poverty-reducing; voiceless, rather than participatory; rootless, rather than culturally enshrined; and futureless, rather than environment-friendly. Economic growth which is jobless, ruthless, voiceless, rootless and futureless is not conducive to human development. The lack of income or income poverty is only one aspect of human impoverishment; deprivation can also occur in other areas- having a short and unhealthy life, being illiterate or not allowed to participate, feeling personal insecurity, etc. Human poverty is thus larger than income poverty.

MEASURING HUMAN DEVELOPMENT-HUMAN DEVELOPMENT INDEX

The UN Development Program (UNDP) defines human development as "a process of enlarging people's choices. The most critical ones are to lead a long and healthy life, to be educated and enjoy a decent standard of living" (U.N. Development Program 1990:10). In the face of widespread assessment that the 1980s was a "lost decade" for developing countries, UNDP has argued that human development disparities between DCs and LDCs are much less than disparities in income per capita, and that human

development narrowed considerably between DCs and LDCs while income gaps were widening (U.N. Development Program 1991:16–18). In its effort to measure human development, UNDP has constructed another alternative measure of welfare, the **Human Development Index**.

The **HDI** summarizes a great deal of social performance in a single composite index combining three indicators – longevity (a proxy for health and nutrition), education, and living standards. Educational attainment is a composite of two variables: a twothirds weight based on the adult literacy rate (in percentage) and a one-third weight on the combined primary, secondary, and tertiary gross enrollment rate (in percentage). Longevity is measured by average life expectancy (in years) at birth, computed by assuming that babies born in a given year will experience the current death rate of each age cohort (the first year, second year, third year, and so forth through the *n*th year) throughout their lifetime. The indicator for living standards is based on the logarithm of per capita GDP in PPP dollars.[19]

Calculating the HDI. To construct a composite index, you determine the maximum and minimum values for each of the three variables – in 2000, life expectancy, from 25 to 85 years, education, adult literacy from 0 to 100, gross enrollment rate from 0 to 100%, and GDP per capita (PPP USS) from $100 to $40,000. You normalize the observed value for each of the three variables into a 0–1 scale. Then you express the performance in each dimension as a value between 0 and 1 by the following formula:

Dimension index = actual value −minimum value/maximum value

−minimum value

Let us compare the indexes and their calculation for India to those of the United States for 2000 (U.N. Development Program 2002:149–152).

Calculating the life expectancy index:

Maximum life expectancy = 85 India's life expectancy index

= (63.3 − 25)/(85 − 25)=38.3/60 = 0.64

Minimum life expectancy = 25 U.S. life expectancy index

= (77.0 − 25)/(85 − 25) = 52/60 = 0.87

Calculating the adult literacy index:

Maximum adult literacy rate = 100 India's adult literacy index

= 57.3/100 = 0.573

Minimum adult literacy rate = 0 U.S. adult literacy index = 100/100 = 1.000

Calculating the combined primary, secondary, and tertiary gross enrollment rate:

Maximum combined primary,

secondary, and tertiary gross

enrollment rate = 100

India's combined primary, secondary, and

tertiary gross enrollment rate

= 55/100 = 0.55

Minimum combined primary,

secondary, and tertiary gross

enrollment rate = 0

U.S. combined primary, secondary, and

tertiary gross enrollment rate

= 95/100 = 0.95

Calculating the education index:

India's education index = 2/3 (adult

literacy index) +1/3 (gross

enrollment index) = 2/3(0.573) +

1/3(0.55) = 0.382 + 0.1833 =

0.5653, which UN Development

Program rounds off to 0.57

U.S. education index = 2⁄3 (adult literacy

index) +1⁄3 (gross enrollment index)

= 2⁄3(1.000) + 1⁄3(0.95) = 0.6667 +

0.3167⁄3 = 0.9834, rounded off to 0.98

Calculating the GDP index:

Logarithm of the maximum GDP per

capita (PPP US$) 40,000 = 4.6021

India's GDP index = 3.3725 − 2⁄4.6021 −

2 = 1.3725⁄2.6021 = 0.53

Logarithm of the minimum GDP per

capita (PPP US$) 100 = 2.0000

Logarithm of U.S. GDP per capita (PPP US$)

34,142 in 2000 = 4.53329

Logarithm of India's GDP per capita

(PPP US$) 2,358 in 2000 = 3.3725

U.S. GDP index = 4.53329 − 2⁄4.6021 −

2 = 2.53329⁄2.6021 = 0.97

Calculating the HDI:

Once you calculate the dimension indices – life expectancy, education, and GDP, determining

HDI is straightforward:

HDI = 1⁄3 (life expectancy index) + 1⁄3 (education index) + 1⁄3 (GDP index)

For India, HDI = 0.21 + 0.19 + 0.177

= .577

For the United States, HDI = 0.29 + 0.326 +

0.323 = 0.939

Some critics argue that development problems are essentially economic problems, a matter of stimulating economic growth. Richard Reichel (1991:57–67) finds that PPP per capita income explains a large proportion of other HDI components. The proportion of variation explained, or R_2, is 0.783 for life expectancy and 0.535 for literacy rate. He concludes that we do not need to measure human development separately from average income. However, most development experts and international agencies reject Reichel's position, arguing that income measures still neglect many important aspects of the development process, leaving much of human development unexplained (see also Trabold-Nubler 1991:236–243).

One example of a substantial divergence between HDI and income rankings is that of South Africa, which ranked 107th in GNP per capita but only 129th among 173 countries in HDI (U.N. Development Program 2002:149–152). Despite the introduction of a universal adult ballot in South Africa in 1994, the country's social indicators still reflect the legacy of decades of a white-ruled **apartheid** (racially separate and discriminatory) economy. South Africa, with 0.695 HDI, is not explained well by its GDP per capita (PPP$9510), comparable to high-humandevelopment economies Chile (0.833 HDI) and Poland (HDI 0.831). Rather, South Africa's HDI, about the same as Algeria, with roughly half the PPP$ GDP per capita, and Syria, with less than half average real GDP, may better reflect its welfare ranking.

HDI does not capture the adverse effect of gender disparities on social progress. In 1995, the U.N. Development Program measured the **gender-related development index (GDI)**, or HDI adjusted for gender inequality. GDI concentrates on the same variables as HDI but notes inequality in achievement between men and women, imposing a penalty for such inequality. The GDI is based on female shares of earned income, the life expectancy of women relative to men (allowing for the biological edge

that women enjoy in living longer than men), and a weighted average of female literacy and schooling relative to those of males. However, GDI does not include variables not easily measured such as women's participation in community life and decision making, their access to professional opportunities, consumption of resources within the family, dignity, and personal security. Because gender inequality exists in every country, the GDI is always lower than the HDI. The top-ranking countries in GDI are Australia, the Nordic countries of Norway, Sweden, and Finland, North America (Canada and the United States), Belgium, Iceland, Netherlands, and the United Kingdom. The bottom six places, in ascending order for GDI, include Sierre Leone, Niger, Burundi, Mozambique, Burkina Faso, and Ethiopia; Afghanistan, ranked lowest in 1995 but lacks 2000 data. In these countries, women face a double deprivation – low human development achievement and women's achievement lower than men (U.N. Development Program 1991:72–79; U.N. Development Program 2002:222–242; 255–258).

One alternative to this measure of GNP growth is to give equal weight to a 1-percent increase in income for any member of society. In the previous example, the 10-percent income growth for the lower 50 percent, although a smaller absolute increase, would be given greater weight than the same rate for the upper 50 percent, because the former growth affects a poorer segment of the population. Another alternative is a **poverty-weighted index** in which a higher weight is given a 1-percent income growth for low-income groups than for high-income groups.

Table 2-1 shows the difference in annual growth in welfare based on three different weighting systems: (1) GNP weights for each income quintile (top, second, third, fourth, and bottom 20 percent of the population); (2) equal weights for each quintile; and (3) poverty weights of 0.6 for the lowest 40 percent, 0.3 for the next 40 percent, and 0.1 for the top 20 percent. In Panama, Brazil, Mexico, and Venezuela, where

income distribution worsened, performance is worse when measured by weighted indices than by GNP growth. In Colombia, El Salvador, Sri Lanka, and Taiwan, where income distribution improved, the weighted indices are higher than GNP growth. In Korea, the Philippines, Yugoslavia, Peru, and India, where income distribution remained largely unchanged, weighted indices do not alter GNP growth greatly (Ahluwalia and Chenery 1974:38–42).

Is poverty-weighted growth superior to GNP-weighted growth in assessing development attainment? Maximizing poverty-weighted growth may generate too little saving, as in Sri Lanka of the 1960s, as the rich have a higher propensity to save than the poor.

Multidimensional Poverty Indices use a range of indicators to calculate a summary poverty figure for a given population, in which a larger figure indicates a higher level of poverty. This figure considers both the proportion of the population that is deemed poor, and the 'breadth' of poverty experienced by these 'poor' households, following the Alkire & Foster 'counting method'.[1] The method was developed following increased criticism of monetary and consumption based poverty measures, seeking to capture the deprivations in non-monetary factors that contribute towards well-being. While there is a standard set of indicators, dimensions, cutoffs and thresholds used for a 'Global MPI',[2] the method is flexible and there are many examples of poverty studies that modify it to best suit their environment. The methodology has been mainly, but not exclusively,[3] applied to developing countries.

The **Global Multidimensional Poverty Index** (**MPI**) was developed in 2010 by the Oxford Poverty & Human Development Initiative (OPHI) and the United Nations Development Programme[4] and uses health, education and standard of living indicators to determine the incidence and intensity of poverty experienced by a population.[5][6] It has since been used to measure acute poverty across over 100 developing countries. The Global MPI is released annually by UNDP and OPHI and the results published in their websites. The MPI is published along with the Human Development Index (HDI) in the Human Development Report.[7] It replaced the Human Poverty Index.

Multidimensional Poverty Indices typically use the household as their unit of analysis, though this is not an absolute requirement.

A household is deprived for a given indicator if they fail to satisfy a given 'cutoff' (e.g. having at least one adult member with at least six years of education). A household is assigned a 'deprivation score' determined by the number of indicators they are deprived in and the 'weights' assigned to those indicators. Each dimension (health, education, standard of living, etc.) is typically given an equal weighting, and each indicator within the dimension is also typically weighted equally. If this household deprivation score exceeds a given threshold (e.g. 1/3) then a household is considered to be 'multiply deprived', or simply 'poor'. The final 'MPI score' (or 'Adjusted Headcount Ratio') is determined by the proportion of households deemed 'poor', multiplied by the average deprivation score of 'poor' households.

MPI advocates state that the method can be used to create a comprehensive picture of people living in poverty, and permits comparisons both across countries, regions and the world and within countries by ethnic group, urban/rural location, as well as other key household and community characteristics. MPIs are useful as an analytical tool to identify the most vulnerable people – the poorest among the poor, revealing poverty patterns within countries and over time, enabling policy makers to target resources and design policies more effectively. Critics of this methodology have pointed out that changes to cutoffs and thresholds, as well as the indicators included and weightings attributed to them can change MPI scores and the resulting poverty evaluation.

Multidimensional Poverty Index (MPI):

The Global MPI uses three standard dimensions: Health; Education; Standard of Living and ten indicators.These mirror the Human Development Index (HDI).

Multidimensional Poverty Indices used for purposes other than global comparison have sometimes used different dimensions, including income and consumption.

lth	ition	ved if a child under the age of 18 years has died in the family In the five years ding the survey.	
	d Mortality	ved if any adult or child, for whom there is nutritional information, is nourished.	
cation	rs of ooling	ved if no household member has completed six years of schooling.	
	ool ndance	ousehold member aged 'school entrance age + six' years or older has completed ars of schooling.	
ndard of ng	king Fuel	ved if the household cooks with dung, wood or charcoal.	;
	itation	ved if the household's sanitation facility is either not improved (according to ium Development Goal guidelines), is shared with other households. or both.	;
	king Water	ved if the household does not have access to improved drinking water (according G guidelines) or improved drinking water is more than a 30-minute walk from home trip.	;
	tricity	household has no electricity	;
	sing	ved if at least one of the three housing materials for roof, walls and floor are quate: the floor is of natural materials and/or the roof and/or walls are of natural or entary materials.	;

	ets	ved if the household does not own more than one of these assets: radio, TV, ione, computer, animal cart, bicycle, motorbike or refrigerator and does not own a truck.	

Alkire-Foster (AF) method

The Alkire-Foster (AF) method is a way of measuring multidimensional poverty developed by OPHI's Sabina Alkire and James Foster. Building on the Foster-Greer-Thorbecke poverty measures, it involves counting the different types of deprivation that individuals experience at the same time, such as a lack of education or employment, or poor health or living standards. These deprivation profiles are analysed to identify who is poor, and then used to construct a multidimensional index of poverty (MPI).

Identifying who is poor

To identify the poor, the AF method counts the overlapping or simultaneous deprivations that a person or household experiences in different indicators of poverty. The indicators may be equally weighted or take different weights. People are identified as multidimensionally poor if the weighted sum of their deprivations is greater than or equal to a poverty cut off – such as 20%, 30% or 50% of all deprivations.

It is a flexible approach which can be tailored to a variety of situations by selecting different dimensions (e.g. education), indicators of poverty within each dimension (e.g. how many years schooling a person has) and poverty cut offs (e.g. a person with fewer than five years of education is considered deprived).

Constructing poverty measures

The most common way of measuring poverty is to calculate the percentage of the population who are poor, known as the headcount ratio (*H*). Having identified who is poor, the AF methodology generates a unique class of poverty measures (*Mα*) that goes beyond the simple headcount ratio. Three measures in this class are of high importance:

- Adjusted headcount ratio (*M*0), otherwise known as the MPI: This measure reflects both the *incidence* of poverty (the percentage of the population who are poor) and the *intensity* of poverty (the percentage of deprivations suffered by each person or household on average). *M*0 is calculated by multiplying the incidence (H) by the intensity (A). *M0* = *H* x *A*.
- *Adjusted Poverty Gap (M1):* This measure reflects the incidence, intensity and depth of poverty. The depth of poverty is the average 'gap' (*G*) between the level of deprivation poor people experience and the poverty cut-off line. *M1* = *H* x *A* x *G*.
- *Adjusted Squared Poverty Gap (M2*): This measure reflects the incidence, intensity, and depth of poverty, as well as inequality among the poor (captured by the squared gap, *S*). *M2* = *H* x *A* x *S*.

M0 can be calculated with ordinal as well as cardinal data, which is why it is most often used. Cardinal data are required to calculate *M1* and *M2*.

The AF Method is unique in that by measuring intensity it can distinguish between, for example, a group of poor people who suffer two deprivations on average and a group of poor people who suffer five deprivations on average at the same time.

1. Adults 19 to 70 years of age (229 to 840 months) are considered undernourished if their Body Mass Index (BMI) is below 18.5 kg/m2. Those 5 to 19 years (61 to 228 months) are identified as undernourished if their age-specific BMI values are below minus two standard deviations from the median of the reference population. In the majority of the countries, BMI-for-age covered people aged 15 to 19 years, as anthropometric data was only available for this age group; if other data were available, BMI-for-age was applied for all individuals 5 to 19 years. Children under 5 years (60 months and under) are considered undernourished if their z-score for either height-for-age (stunting) or weight-for-age (underweight) is below minus two standard deviations from the median of the reference population . Nutritional information is not provided for households without members eligible for measurement, these households are assumed to be not deprived in this indicator.

2. All reported deaths are used if the date of child's death is not known.
3. Child mortality information is typically collected from women of reproductive ages 15-49 years. Households without women of such ages do not provide information about child's deaths and are assumed to be not deprived in this indicator.
4. This country-specific age cutoff was introduced in 2020. Previously, the age cutoff was 10 years which did not recognize the fact that by age 10 children do not normally complete 6 years of schooling.
5. Source for official entrance age to primary school: United Nations Educational, Scientific and Cultural Organization, Institute for Statistics database. Education systems.
6. A household is considered to have access to improved sanitation if it has some type of flush toilet or latrine, or ventilated improved pit or composting toilet, provided that they are not shared. If the survey report uses other definitions of improved sanitation, we follow the survey report.
7. A household has access to improved drinking water if the water source is any of the following types: piped water, public tap, borehole or pump, protected well, protected spring or rainwater, and it is within 30 minutes' walk (round trip). If the survey report uses other definitions of improved drinking water, we follow the survey report.
8. A few countries do not collect data on electricity because of 100% coverage. In such cases, we identify all households in the country as non-deprived in electricity.
9. A household is considered deprived if the dwelling's floor is made of mud/clay/earth, sand or dung; or if the dwelling has no roof or walls or if either the roof or walls are constructed using natural materials such as cane, palm/trunks, sod/mud, dirt, grass/reeds, thatch, bamboo, sticks or rudimentary materials such as carton, plastic/ polythene sheeting, bamboo with mud/stone with mud, loosely packed stones, uncovered adobe, raw/reused wood, plywood, cardboard, unburnt brick or canvas/tent.
10. Television (TV) includes smart TV and black and white TV, telephone includes cell phones, computer includes tablets and laptops, and refrigerator includes freezers.

Inequality (GINI) Indices

Inequality can be viewed from different perspectives, all of which are related. Most common metric is *Income Inequality*, which refers to the extent to which income is evenly distributed within a population. Related concepts are *lifetime Inequality* (inequality in incomes for an individual over his or her lifetime), *Inequality of Wealth* (distribution of wealth across households or individuals at a moment in time), and *Inequality of Opportunity* (impact on income of circumstances over which individuals have no control, such as family socioeconomic status, gender, or ethnic background). All of these inequality concepts are related and offer different yet complementary insights into the causes and consequences of inequality, hence providing better guidance to governments when designing specific policies aimed at addressing inequality.

Gini coefficient is a typical measure of income inequality. The coefficient varies between 0 and 1, with 0 representing perfect equality and 1 perfect inequality. Most of the analysis is centered on the concept of income inequality as captured by the Gini coefficient, which is available for a large number of countries and relatively long periods. Unless specified otherwise, Gini income inequality refers to disposable income or consumption and thus already reflects any redistribution through taxes and transfers.

Definition of GINI Indices

In economics, the Gini coefficient, also known as the Gini index or Gini ratio, is a measure of demographic distribution with the aim of projecting the income of a nation's populace. The Gini coefficient is the most commonly used estimation of inequality.

The Gini Coefficient is named after Italian statistical and sociologist Corrado Gini who developed the coefficient.

The Gini index is the Gini coefficient expressed as a percentage (%) and is equal to the Gini coefficient multiplied by 100. (The Gini coefficient is equal to half of the relative mean difference.) The Gini coefficient is often used to measure income inequality.

How is the Gini Coefficient Measured?

The explanation is given below in points:

- A value of 0 indicates perfect equality (where everybody has the same wealth/income) and 1 indicates perfect inequality (that is, where one person owns all the wealth in a country).
- Practically, the value falls between 0 and 1 for most countries. In countries with high inequality, the value would be close to 1.
- A value below 0.4 is considered acceptable generally.
- There are multiple ways to calculate the Gini Coefficient.
- The two most popular methods are:
    - Based on pre-tax (market) income
    - Based on disposable income
- The second method takes into account taxes and social spending as well.
- The difference in both methods is an indicator of the efficacy of an economy's fiscal policy in bringing down the rich-poor divide by means of social spending and taxation.
- Mathematically, the Gini Index is defined based on the **Lorenz Curve**. The Lorenz Curve is a graphical representation of the distribution of wealth/income.
- The Lorenz curve was developed by Max O. Lorenz in 1905 to represent inequality in wealth distribution. In other words, it is a graphical representation of the distribution of income or wealth.

Explanation of Lorenz Curve

The Lorenz curve is represented by a straight diagonal line, which represents perfect equality in income or wealth distribution; the Lorenz curve lies beneath it, showing estimated distribution. The area that is between the straight line and the curved line is the GINI coefficient.

The Gini Coefficient itself is expressed as a representation of the scalar measurement of inequality. In the Lorenz Curve, the Gini Coefficient is expressed as the ratio of the area under the straight line

The Lorenz curve is used to represent economic inequality as well as unequal wealth distribution. The farther away the curved line is way from the straight diagonal line, the higher the level of inequality.

Constructing a Lorenz curve involves fitting a continuous function to some incomplete set of data, there is no guarantee that the values along a Lorenz curve (other than those actually observed in the data) actually correspond to the true distributions of income.

Most of the points along the curve are just guesses based on the shape of the curve that best fits the observed data points. So the shape of the Lorenz curve can be sensitive to the quality and sample size of the data and to the mathematical assumptions and judgments as to what constitutes the best fit curve, and these may represent sources of substantial error between the Lorenz curve and the actual distribution.

For better clarity, the Lorenz curve will be better elaborated upon through the image below:

The curve (B) is a graph showing the proportion of overall income or wealth assumed by the bottom x% of the people, although this is not rigorously true for a finite population. It is often used to represent income distribution, where it shows for the bottom x% of households, what percentage, represented by a straight line – A, (y%) of the total income they have. The percentage of households is plotted on the x-axis, the percentage of income on the y-axis. It can also be used to show the distribution of assets. In such use, many economists consider it to be a measure of social inequality.

The Gini coefficient is the ratio of the area between the line of perfect equality and the observed Lorenz curve to the area between the line of perfect equality and the line of perfect inequality.

GINI=A/(A+B)

Gini Coefficient Significance

Gini coefficient is useful because it projects negative values for income and wealth which standard measures of inequality are unable to provide. But it does have its fair share of limitations.

For example, it samples people at random points of their lives, which means that it can't separate those whose financial futures are reasonably secure from those who do not have prospects, even in a large sample.

Other reasons why it is important is as follows:

- An increase in the Index implies that the government's policies benefit the rich more than the poor and are not inclusive enough.
- So, a higher ratio may encourage the government to spend more on social welfare schemes and also increase the tax burden on the rich.
- It is important that the government tries to maintain a good ratio so that the rich-poor divide can be kept in check.

Gini Coefficient India

- As per the World Bank, India's Gini Index is 35.2 (0.35) as of March 2020
- Currently, though, it is estimated to be close to 0.50, which is the highest value to date. Lesotho currently holds the distinction of the country having the highest Gini Coefficient at 0.632. The World Bank report indicates that India's high population and uneven distribution of wealth is responsibly for its low performance in the index

Nations with high Gini Coefficient

The following table gives a ranking of the top 10 nations with a high Gini Coefficient:

Countries with the highest Gini coefficients

Country	Rankings
Lesotho	0.632
South Africa	0.625
Haiti	0.608
Botswana	0.605
Namibia	0.597
Zambia	0.575
Comoros	0.559
Hong Kong	0.539
Guatemala	0.530
Paraguay	0.517

2 Marks

1. Define per capita income.

2. State the three dimensions of Human Development Index (HDI).

3. Define Gender Development Index(GDI)

4. Define Multi dimensional Poverty (MPI)

5. Define GINI coefficient.

6. What do you mean by sustainable development?

7. What is *Adjusted Poverty Gap ?*

5 Marks

1. Write a short note on Ikire-Foster (AF) method of measuring Global Multidimensional Poverty Index.

2. Write a short note on sustainable development.

3. Write a short note on Lorenz curve.

4. Write a short note on Gini coefficient.

5. Write a short note on Human development Index.

10 Marks

1. What are basic difference between growth and development?

2. Do you think per capita national income to be a good measure of economic development?

3. State the significance of Lorenz curve & Gini Coefficient.

4. State the Millenium Development goals.