Human Development Index (HDI)

1. Introduction to HDI

The Human Development Index (HDI) is a composite statistical measure used to evaluate the overall level of human development of a country. The value of HDI ranges from 0 to 1. It was introduced in 1990 by the United Nations Development Programme to shift the focus of development economics from mere economic growth (GDP) to human well-being. The idea was strongly influenced by the works of Mahbub ul Haq and Amartya Sen.

2. Conceptual Foundation: Capability Approach

The conceptual foundation of HDI lies in the Capability Approach, developed by Amartya Sen. According to this approach, development should be assessed not by the resources people have, but by what they are able to do and become. This means:

- Development is about freedom and choices
- People should have the capability to:
    - Live a healthy life
    - Be educated
    - Participate in society

Thus, HDI measures functioning (achievements) and capabilities (opportunities) rather than just income.

3. Objectives of HDI

The HDI was developed with several important objectives in mind. These are as follows:

a) To provide a broader measure of development beyond GDP
b) To enable comparison across countries
c) To highlight inequalities in development
d) To guide governments in policy formulation
e) To focus on human welfare and quality of life

4. Dimensions and Indicators of HDI

HDI is constructed using three basic dimensions, each representing a fundamental aspect of human development.

(i) Health Dimension: Health is measured by Life Expectancy at Birth (LE). It indicates the ability to live a long and healthy life. Higher life expectancy indicates better health conditions, and reflects healthcare facilities, nutrition, sanitation

(ii) Education Dimension: Education is measured using two indicators:

- Mean Years of Schooling (MYS): Average years of education received by adults
- Expected Years of Schooling (EYS): Number of years a child is expected to study

These two are combined to form the education index.

(iii) Standard of Living Dimension: This is measured by Gross National Income (GNI) per capita (PPP, US$). It reflects income and purchasing power. It uses logarithm to show diminishing importance of income

5. Method of Calculation of HDI (Latest Method)

HDI developed by the United Nations Development Programme, is calculated through a systematic process that converts raw data into standardized indices and then combines them

into a single composite index. The method ensures comparability across countries and reflects balanced development.
The calculation involves two major stages:

1. Normalization of each dimension into indices (0 to 1 scale)
2. Aggregation using geometric mean

5.1 Normalization of Indicators (Dimension Indices): In the first step, each of the three dimensions- health, education, and income is converted into an index ranging from 0 to 1. This is done using a minimum and maximum value (goalposts) fixed by UNDP.
General Formula of Dimension Index

$$\text{Dimension Index} = \frac{\text{Actual Value} - \text{Minimum Value}}{\text{Maximum Value} - \text{Minimum Value}}$$

This process is called normalization, and it ensures:

- Different units (years, dollars) become comparable
- Values are standardized across countries

5.2. Health Index (Life Expectancy Index): The health dimension is measured using Life Expectancy at Birth (LE). UNDP assumes: Minimum value = 20 years and Maximum value = 85 years
It is calculated as,

$$\text{Health Index} = \frac{LE - 20}{85 - 20}$$

Explanation:

- If a country has higher life expectancy, its health index will be closer to 1
- It reflects healthcare, nutrition, sanitation, and living conditions

5.3. Education Index: Education is slightly more complex because it has two components:
(i) Mean Years of Schooling Index (MYSI)

- Maximum = 15 years

$$\text{MYSI} = \frac{MYS}{15}$$

(ii) Expected Years of Schooling Index (EYSI)

- Maximum = 18 years

$$\text{EYSI} = \frac{EYS}{18}$$

Finally, Education Index is calculated as follows:

$$\text{Education Index} = \frac{MYSI + EYSI}{2}$$

Explanation:

- MYS reflects past educational attainment
- EYS reflects future educational opportunities
- Their average gives a balanced view of education

5.4. Income Index (Standard of Living): The standard of living is measured using Gross National Income (GNI) per capita (PPP US$). Unlike other dimensions, income is transformed using natural logarithm (ln). It is calculated as follows:

$$\text{Income Index} = \frac{\ln(GNI) - \ln(100)}{\ln(75000) - \ln(100)}$$

In calculating income index $100 and $75,000 is considered as minimum and maximum income respectively. Logarithm is used due to the following reasons:

- Income has diminishing returns on well-being
- An increase from $1,000 to $2,000 matters more than from $50,000 to $51,000

5.5 Aggregation: Final HDI Calculation Formula

The final step in calculating the HDI is to combine the three-dimension indices into a single composite index. This is done using the geometric mean, which ensures balanced development across all dimensions.

$$HDI = \sqrt[3]{I_{health} \times I_{education} \times I_{income}}$$

Here, I_{health}= Health Index, $I_{education}$= Education Index and I_{income}= Income Index

6. Classification of Countries Based on HDI

Countries are classified into four categories based on their HDI value:

- Very High Human Development: 0.800 and above
- High Human Development: 0.700 – 0.799
- Medium Human Development: 0.550 – 0.699
- Low Human Development: Below 0.550

7. Importance of HDI

HDI is an important tool in economics and policy-making. It has several advantages:

a) Provides a comprehensive measure of development
b) Helps in international comparison
c) Focuses on human welfare rather than income alone
d) Assists governments in identifying development gaps
e) Encourages investment in health and education

8. Limitations of HDI

Despite its usefulness, HDI has some limitations. These are as follows:

a) It ignores inequality within a country
b) It does not include gender disparities
c) It does not consider environmental sustainability
d) It includes only three dimensions, ignoring other aspects like political freedom

9. Improvements and Alternative Indices

To overcome its limitations, UNDP introduced additional indices as an alternative to HDI, which are as follows:

i. IHDI (Inequality-adjusted HDI): Adjusts HDI for inequality
ii. GDI (Gender Development Index): Measures gender gaps
iii. MPI (Multidimensional Poverty Index): Measures multiple deprivations