Human Development Index (HDI)

The united nation development programme (UNDP) has been developing the measurement of human development in terms of human development index (HDI) since 1990.

HDI is a composite index of the average achievement in 3 basic dimension of human development. They are —

1) A too long & healthy life as measured by life expectancy at birth.
2) Knowledge as measured by adult literacy rate (with 2/3 weight) & the combined primary, secondary & tertiary gross enrolment ratio with 1/3rd weightage
3) A decent standard of living as measured by GDP per capita (PPP US $)

Before calculating H.D.I an index for each of the 3 dimensions is created for this purpose maximum & minimum value are chosen for each indicator

Maximum & minimum values

Indicator	Max value	Min value
1) Life expectancy at birth	85	25
2) Adult literacy	100	0

SD indicators	Max value	Min value
3. Gross enrollment ratio	100	0
4) G.D.P per capita (PPP US $)	40,000	100

Performance in each dimension is expressed as a value between 0 & 1 by applying the following formula

$$\text{Dimension index} = \frac{\text{Actual value} - \text{Min}^{n} \text{ value}}{\text{Max}^{n} \text{ value} - \text{Min}^{n} \text{ value}}$$

The HDI is calculated as a simple average of the dimension indices. The HDI values for each country indicates the distance it has travel towards the maximum possible value of one & how-far it has to go to attain certain define ~~goal~~ goals :- An average life span of 85 years, ~~on~~ access to education for all & decent standard of living. The HDI ranks countries in relation to each other. A country's HDI is within the world distribution i.e it is based on its HDI values in relation to each developed & developing countries for which the particular country has travelled from the min HDI value of '0' to max^{n} HDI value of 1.

Countries with HDI value '0.5' are considered to have low level of H.D; Those between 0.5 to 0.8 are medium level & Those above 0.8 are ~~condi~~ considered as High level.

How to construct H.D.I

To ~~illustrate~~ illustrate the construction of HDI Let us consider 2 countries India & Germany Basic variables of the countries are -

Countries	Life enpactancy at birth	Adult literacy rate	Real GDP Per capita	*
India	62.9	56.5	2248	
~~	~~~~	~~~~	~~~~	
ermany	77.6	99.0	23742	

*	Combined enrollment ratio
India	56
~~	~~~~
ermany	94

For construction of Dimension index

1) Life enpectancy at birth index

$$\text{India} = \frac{\text{Actual value} - \text{Min}^{n} \text{value}}{\text{Max}^{n} \text{value} - \text{Min}^{n} \text{value}} = \frac{62.9 - 25}{85 - 25} = 0.631$$

Germany = $\frac{77.6 - 25}{85 - 25}$

= 0.87

2) Adult literacy index

India = $\frac{56.5 - 0}{100 - 0}$

= $\frac{56.5}{100}$

= 0.565

Germany = $\frac{99.0 - 0}{100 - 0}$

= 0.99

3) Combined enrollment ratio index

India = $\frac{56 - 0}{100 - 0}$

= 0.56

~~India~~

Germany = $\frac{94 - 0}{100 - 0}$

= 0.94

4) ~~Real GDP per capita (US $) index~~

Then come the educational attainment index —

India = $0.56 \times \frac{2}{3} + 0.56 \times \frac{1}{3}$ {2/3 & 1/3 from formula}

$= \frac{0.56 \times 2 + 0.56 \times 1}{3}$

$= \frac{1.12 + 0.56}{3}$

$= 0.56$

Germany $= \frac{0.99 \times 2 + 0.94 \times 1}{3}$

$= 1.98 + 0.94$

$= 0.97$

4) Adjusted real GDP per capita —

over the years HDRC (Human Development report) has used Atkinsan's formula of Income index. Now a days the following formula based on the work of Sudhir Anand & Amartya Sen is used for the construction of this index

$$w(Y) = \frac{\log(Y) - \log(Y_{min})}{\log(Y_{max}) - \log(Y_{min})}$$

where

$w(y)$ = adjusted real GDP per capita.

(Y) = Real GDP per capita

for

India = $\frac{\text{Log } 2248 - \text{Log } 100}{\text{Log } 40,000 - \text{Log } 100}$

= $\frac{1.35}{2.60}$

= 0.519

Germany = $\frac{\text{Log } 23742 - \text{Log } 100}{\text{Log } 40,000 - \text{Log } 100}$

= or $\frac{2.37}{2.60}$

= 0.911

Calculation of H.D.I

countries	Life enpentancy index	Educatn attainment	Adjusted real GDP	HDI
India	0.63	0.56	0.52	0.57
Germany	0.87	0.97	0.911	0.92

India's HDI = $\frac{0.63 + 0.56 + 0.52}{3}$ = 0.57

Germany's " = $\frac{0.87 + 0.97 + 0.911}{3}$ = 0.92

Limitations

The HDI is not free from certain limitations. Some of them are —

1) According to Amartya Sen, HDI is a crude index which attempts to catch in simple numbers about the complex reality of human development & deprivation.

2) The 3 indicators, i.e life expectancy, educational attainment & decent standard of living are not the only indicators of human development. There can be other indicators like infant mortality, nutrition.

3) HDI measure relative rather than absolute human development so that if all countries improve their HDI values at the same weighted rate the no-human development countries will not get their recognition for their empowerment.