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HUMAN DEVELOPMENT INDEX: CALCULATING ANALYSIS

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INTRODUCTION

Most people today live longer, are more educated and have more access to goods and services than ever before. Even in economically distressed countries, people's health and education have improved greatly. And progress has extended to expansion in people's power to select leaders, influence public decisions and share knowledge.

Witness the gains in our summary measure of development, the Human Development index (HDI), a simple composite measure that includes health, schooling and income. The world's average HDI increased 18 percent between 1990 and 2010 (41 percent since 1970), reflecting large improvements in life expectancy, school enrolment, literacy and income. Almost all countries benefited. Of the 135 countries in our sample for 1970-2010 (with 92 percent of the world's people), only three had a lower HDI in 2010 than in 1970. Poor countries catching up with rich countries on the HDI, convergence that paints a far more optimistic picture than do trends in income, where divergence continues.Recent rank is 131 .

But not all countries have seen rapid progress, and the variations are striking. People in Southern Africa and the former Soviet Union have endured times of regress, especially in health. And countries starting from the same position had markedly different experiences. China's per capita income grew an astounding 1200 percent over the 40 years, but the Democratic Republic of the Congo's fell 80 percent. Advances in technical knowledge and globalization made progress more feasible for countries at all levels of development, but countries took advantages of the opportunities in different ways.

OBJECTIVES OF THE STUDY

1) To Study the Human Development Indices
2) To Study the Human Development Dimension Indices
3) To Study the How Calculating Human Development Index.

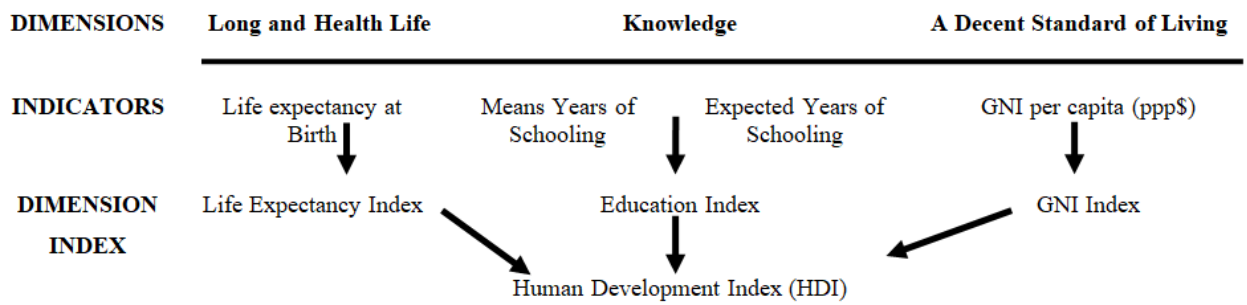
RESEARCH METHODOLOGY

The present research papers fully depend on the secondary data. They require data have been collected from UNDP Human Development Report.

HUMAN DEVELOPMENT INDICES

The Human Development Index (HDI) is a summary measure of human development. It measures the average achievements in a country in three basic dimensions of human development; a long and healthy life, access to knowledge and a decent standard of living. The HDI is the geometric mean of normalized indices measuring achievements in each dimension. For a full elaboration of the method and its rationale, this technical note described the steps to create the HDI, data sources and the methodology used to express income.

Calculating the Human Development Indices - Graphical Presentation:-



Steps to Estimate the Human Development Index :-

There are two steps to calculating the HDI.

Step 1. Creating the Dimension Indices :-

Minimum and maximum values (goalposts) are set in order to transform the indicators into indices between 0 and 1. The maximums are the highest observed values in the time series (1980-2011). The minimum values can be appropriately conceived of as subsistence values. The minimum values are set at 20 years for life expectancy, at 0 years for both education variables and at $100 for per capita gross national income (GNI). The low value

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for income can be justified by the considerable amount of unmeasured subsistence and nonmarket production in economies close to the minimum, not captured in the official data.

Goalposts for The Human Development Index in this Report :-

Dimension	Observed Maximum	Minimum
Life Expectancy	83.4 (Japan, 2011.)	20.0
Mean years of Schooling	83.4 (Czech Republic, 2005)	0
Expected Years of Schooling	18.0 (Capped at)	0
Combined Education Index	0.978 (New Zealand, 2010)	0
Per Capita Income (PPP$)	107,721 (Qatar, 2011)	100

Source : HDI Report 2011.

Having defined the minimum and maximum values, the sub-indices are calculated as follows.

$$\text{Dimension Index} = \frac{\text{Actual Value} \quad \text{Minimum Value}}{\text{Maximum Value- Minimum Value}} \quad . (1)$$

For education, equation 1 is applied to each of the two sub-components, then a geometric mean of the resulting indices is created and finally, equation 1 is reapplied to the geometric mean of the indices using 0 as the minimum and the highest geometric mean of the resulting indices for the time period under consideration as the maximum. This is equivalent to applying equation 1 directly to the geometric mean of the two subcomponents.

Because each dimension index is a proxy for capabilities in the corresponding dimension, the transformation function from income to capabilities is likely to be concave. Thus, for income the natural logarithm of the actual minimum and maximum values is used.

Step 2. Aggregating the Sub-Indices to Produce the Human Development Index :-

$$(I_{Life}^{1/3} \cdot I_{Education}^{1/3} \cdot I_{Income}^{1/3})$$

Example : Viet Nam :

Indicator	Value
Life Expectancy at Birth (Years)	75.2
Mean Years of Schooling(Years)	505
Expected Years of Schooling (Years)	10.4
GNI Per Capita (PPS$)	2,805

Note : Values are rounded.

Life Expectancy Index = $\frac{75.2-20}{83.4-20}$ = **0.870**

Mean Years of Schooling Index = $\frac{5.5-0}{13.1-0}$ = **0.478**

Expected Years of Schooling Index = $\frac{10.4-0}{18-0}$ = **0.576**

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$$\text{Education Index} = \frac{\sqrt{0.478.0.576-0}}{0.978-0} = \mathbf{0.503}$$

$$\text{Income Index} = \frac{\text{In (2,805)} - \text{In (100)}}{\text{In (107,721)} - \text{In (100)}} = \mathbf{0.478}$$

$$\text{Human Development Index} = \sqrt[3]{0.870.\ 0.503.\ 0.478} = \mathbf{0.593}$$

DATA SOURCES

[1] Life Expectancy at Birth : UNDESA (2011)

[2] Mean Years of Schooling : HDRO Updates (http://hdr.undp.org/en/ statiscits) based on UNESCO data on Education Attainment (http://stats. uis.unesco.org/unesco) using the methodology outlined in Barro and Lee (2010a)

[3] Expected years of Schooling : UNESCO Institute for Statistics (2011).

[4] GNI per capita : World Bank (2011a), IMF (2011), UNSD (2011) and UNDESA (2011).

METHODOLOGY USED TO EXPRESS INCOME

GNI is traditionally expressed in current term. To make GNI comparable across time, GNI is converted from current to constant terms by taking the value of nominal GNI per capita in purchasing power parity (PPP) terms for the base year (2005) and building a time series using the growth rate of real GNI per capita, as implied by the ratio of current GNI per capita in local currency terms to the GDP deflator.

Official PPPs are produced by the International Comparison Program (ICP), which periodically collects thousand of prices of matched goods and services in many countries. The last round of this exercise refers to 2005 and covers 146 countries. The World Bank produces estimates for years other than the ICP benchmark based on inflation relative to the United States. Because other international organizations- such as the World Bank and the International Monetary Fund (IMF)- quote the base year in terms of the ICP benchmark, the HDRO does the same.

To obtain the income value for 2011, IMP – projected GDP growth rates (based on constant terms) are applied to the most recent GNI values. The IMF- Projected growth rates are calculated in local currency terms and constant prices rather than in PPP terms. This avoids mixing the effects of the PPP conversion with those of real growth of the economy.

ESTIMATING MISSING VALUES

For a small number of countries that were missing one out of four indicators, the HDRO filled the gap by estimating the missing value using cross-country regression models. The details of the models used are available at http://hdr.undp.org/en/statistics/undestanding/issues).

In this research paper, the PPP conversion rates were estimated for three countries (Cuba, Occupied Palestinian Territory and Palau), expected years of schooling were estimated five countries (Barbados, Haiti, Montenegro, Singapore and Turkmenistan) and mean years of schooling were estimated for eight countries (Antigua and Barbuda, Eritrea, Grenada, Kiribati, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, and Vanuatu). This brought the total number of countries in the HDI in 2011 up to 187, from 169 in 2010.

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2) UNDP (2010), "World Human Development Report 2010", Published by UNDP, New York.

3) UNDP (2011), "World Human Development Report 2011", Published by UNDP, New York.

4) www.undp.org.in

5) www.hdr.org.in