A Comparative Study of Education Indices between UNDP's Human Development Report and National Human Development Report of India

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Abstract

The concept of human development is much deeper and richer than what can be captured in any composite index or even by a detailed set of statistical indicators. Human development is the outcome of numerous varied factors, involved in the processes of development. But health and education are the two most vital factors of human development. Simple tools are needed to monitor the progress in human development. The HDI, GDI, GEM and HPI all provide summary information about human development in a country. In this paper, an attempt has been made to compare the education indices of Human Development Report (UNDP) and National Human Development Report of India and their implications for the development of other human development indicators in India.

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Human Development Report (UNDP)

Since the publication of the first Report in 1990, the *Human Development Report* has developed and constructed several composite indices to measure different aspects of human development. The human development index (HDI), constructed every year since 1990, compresses the average achievements in basic human development in one simple composite index and does the ranking of the countries accordingly. The gender-related development index (GDI) and the gender empowerment measure (GEM), introduced in ***Human Development Report* 1995**, are composite measures of the gender inequalities in human development. The GDI measures the achievements in the same dimensions and using the same variables as the HDI does, but it takes into account the inequality in achievement among the men and women. The GEM measures the gender inequality in economic and political opportunities.

***Human Development Report* 1997** also introduced the concept of human poverty and formulated a composite measure of the human poverty index (HPI). While the HDI measures the average achievements in the basic dimensions of human development, the HPI measures the deprivations in those dimensions. Table 1 presents the basic dimensions of human development which are captured by the indices and indicators used to measure them.

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indicators. Simple tools are needed to monitor progress in human development. The HDI, GDI, GEM and HPI all provide summary information about human development in a country.

Three major points have to be noted. First, income is not the sum of total human lives, nor is its lack the sum total of human deprivations. Thus, by focusing on areas beyond income and treating income as the proxy of a decent standard of living, both the HDI and the HPI provide a more comprehensive measure of human well–being than income or want of it. Second, the composite indices of human development do not, by themselves, provide a complete picture. They must be supplemented with other indicators of human development. Third, human development is the consequence/outcome of the

process of transformation of the members of population of a country through investment in food, nutrition, hygiene, sanitation, health and education. Various components of HDI just reflect the level of this outcome of the process of transformation. Interestingly, there is an autonomous component of this transformation process that occurs in time. Exogenous interventions may accelerate and/or strengthen this autonomous process of transformation. It cannot be supplanted by human intervention, say investment. For example, right from the day of conception, the human foetus grows as time proceeds and the growth process continues to operate even after birth till the maturity stage is reach. At that point, it stagnates beyond this point, there is bound to occur the reversal of process of growth at least on the health front, strength and stamina as the process of ageing sets in. UNDP indices have blissfully neglected this aspect. (Prakash, S.2000).

Human Development Index (HDI)

The HDI is a summary measure of human development. It measures the average achievements in a country in three basic dimensions (called as indicators) of human development:

- A long and healthy life, as measured by life expectancy at birth;
- Knowledge, as measured by the adult literacy rate (with two-thirds weight) and the combined primary , secondary and tertiary gross enrolment ratio (with one third weight); and
- A decent standard of living, as measured by GDP per capita (PPP US$).

A few missing links may be noted. Longevity, by itself, does not reflect the state of health. A better aspect may be to consider the proportion of population in separate age and gender groups free from disease. Proportion of population receiving medical treatment and going without treatment may be assigned lower weights. Under education, better indicators are available to choose from (see Mehta, 2003 and Prakash et. al. 1995). Besides the weighing needs fine-tuning.

Before the HDI itself is calculated, an index needs to be created for each of these dimensions. To calculate these indices – the life expectancy, education and GDP indices-minimum and maximum values (goalposts) are chosen for each underlying indicator. Performance in each dimension is expressed as a value between 0 and 1 by applying the following general formula:

Dimension Index = (Actual Value - Minimum Value) / (Maximum Value – Minimum Value)

The HDI is then calculated as a simple average of the dimension indices. The box at right illustrates the calculation of the HDI for a simple country.

Goalposts for calculating the HDI

Indicator	Maximum Value	Minimum value
Life expectancy at birth(years)	85	25
Adult literacy rate (%)	100	0
Combined gross enrolment ratio (%)	100	0
GDP per capita(PPP US$)	40000	100

Source: Human Development Report, 2003, New York, Oxford University Press, Technical Note - 1

Calculating the HDI

1. Calculating the Life Expectancy Index

The life expectancy index measures the relative achievement of a country in the matter of control of mortality rate and investment in health.

Life Expectancy Index = (Life expectancy in years – Minimum life expectancy in years) / (Maximum life expectancy in years - Minimum life expectancy in years)

2. Calculating the Education Index

The education index measures a country's relative achievement in both adult literacy and combined primary, secondary and tertiary gross enrollment. First, an index for adult literacy and one for combined gross enrolment are calculated. Then these two indices are combined to create the education index, with two-thirds weight given to adult literacy and one-third weight to combined gross enrollment.

Education Index = 2/3 (Adult Literacy Index) + 1/3 (Gross Enrolment Index)

3. Calculating the GDP Index

The GDP index is calculated using adjusted GDP per capita (PPP US$). In the HDI, income serves as a surrogate for all the dimensions of human development not reflected in a long and healthy life and in knowledge. Income is adjusted because achieving a respectable level of human development does not require unlimited income. Accordingly, the logarithm of income is used. To reflect this, income is discounted in calculating the HDI according to the following formula:

$$W_{(y)} = (\log y - \log y_{min}) / (\log y_{max} - \log y_{min})$$

However, the range of goods available for consumption does not figure in the calculation.

4. Calculating the HDI

Once the dimension indices have been calculated, determining the HDI is straightforward. It is a simple average of the three dimension indices.

HDI = 1/3 (Life Expectancy Index) + 1/3 (Education Index) + 1/3 (GDP Index)

All the weights may be determined more objectively by statistical procedure. For example, both cardinal and ordinal factors may be loaded into a factor analytic framework developed by Prakash et. al.

National Human Development Report (India)

Following the UNDP's human development framework, the National Human Development Report of India seeks to put together the indicators and composite indices to evaluate the development process in terms of `ex-post outcomes' rather than only in terms of available `means' or `inputs'. The Report, recognizing the broad-based consensus that exists on the three critical dimensions of well-being, focuses on identifying the various contextually relevant indicators on each of them. These dimensions of well-being are related to:

- Longevity, the ability to live a long and healthy life;
- Education, the ability to read, write and acquire knowledge; and
- Command over resources, the ability to enjoy a decent standard of living and have a socially meaningful life.

A major objective of the NHDR of India is to bring about a certain conceptual and methodological consensus on the use of human development approach in the country in general and the framework for identifying indicators and building composite human development indices at the State level, in particular. It is expected that the NHDR of India may guide similar initiatives at sub-State level in future. Specifically, an attempt has been made to map the state of human development by putting together `outcome' indicators and composite indices that are contextually relevant and reflect the collective social

valuation and development priorities of the country. Also, in undertaking comparisons at regional level for a country like India, it may not be appropriate to use the same set of indicators/indices developed for facilitating cross-country comparisons, spanning countries from the least developed to the industrially matured economies, as is the case with the UNDP HDRs.

Human Development Index (HDI) of NHDR of India

$$\mathbf{HDI_j = 1/3 * \sum_i (X_i)}$$

Where HDI is for the j^{th} State, i goes from 1 to 3; and

$$\mathbf{X_i = (X_{ij} - X_i^{*}) / (X_i^{**} - X_i^{*})}$$

Where Xij refers to the attainment of the j^{th} State on the i^{th} indicator; Xi^{**} and Xi^{*} are the scaling maximum and minimum norms, such that :

X_1 : Inflation and inequality adjusted per capita consumption expenditure;
X_2 : Consumption indicator of educational attainment;
X_3 : Composite indicator of health attainment.

$$\mathbf{X_2 = [(e_1 * 0.35) + (e_2 * 0.65)]}$$

Where e_1 is literacy rate for the age group 7 years and above, and e_2 is adjusted intensity of formal education.

$$\mathbf{X_3 = [(h_1 * 0.65) + (h_2 * 0.35)]}$$

Where h_1 is life expectancy at age one, and h_2 is infant mortality rate(IMR). In case of IMR, the reciprocal of the indicator has been used.

Constructing Development Radars

The different indicators included in the development radars have been scaled and normalised to take a value on a scale ranging from 0 to 5. As a result, on each indicator including the IMR and poverty ratio, where the reciprocal of the indicator has been used, the scaled least achievement corresponds to 0, where the best achievement is closer to 5. In undertaking the said scaling procedure, desirable norms had to be adopted for the chosen indicators. In some cases the

norms are self-selecting, as for instance, is the case with access to safe drinking water or literacy rate, and in some others, like per capita consumption expenditure or even infant mortality rate, there is an element of value judgement. In case of the inflation, adjusted per capita consumption expenditure (at 1983 price) the maximum has been pegged at Rs.500 per capita per month. For poverty ratio, the minimum has been kept at 5 per cent such that it corresponds to a value of 5 on a scale of 0 – 5 on the radar. In all these cases, the scaling norms are as per the following table.

Scaling Norms for HDI

Indicator	Minimum	Maximum
Consumption Expenditure (per capita per month)	Rs.65	Rs.325
Literacy Rate for 7+ years	0	100
Adjusted intensity of formal education(estimated)	0	7
Life expectancy at age one	50 years	80 years
Infant mortality rate	20 per 1000	-------

Source: Human Development Report, 2003, New York, Oxford University Press, Technical Note – 1.

Education Indices of Human Development Report (UNDP) and National Human Development Report of India : A Comparison

(1) Both UNDP's Human Development Report and NHDR of India seek to put together indicators and composite indices to evaluate development process in terms of `ex-post outcomes' rather than in terms of available `means' or `inputs'. But unlike UNDP's Human Development Report, the NHDR of India takes into account both the `conglomerate perspective', which captures advances made by the society as a whole and the `deprivational perspective' which assesses the status of the deprived in a society, since both these perspectives are needed to adequately understand the process of development in any society.

(2) UNDP's HDR presents data for most key indicators with only a two–year lag between the reference date for the indicators and the date of Report's release. But in NHDR of India, the entire data set has been compiled for, at least, two points of time, namely for early eighties (covering the period 1981-83), early nineties (covering the period 1991-93) and, wherever available, for the most recent year (including the available preliminary data from Census 2001). An important concern in building the database has been to also identify indicators that are readily available at sub-State level of disaggregation. This has prompted an extensive use of Census of India data. In addition, data for alternative sources, including the National Sample Survey Organization (NSSO), National Family Health Surveys (NFHS) and other official and some independent sources has also been used. The data have been presented for all States and Union Territories. This, in some cases, has necessitated recourse to estimating data to fill-up the gaps for a few States. But it projects the regional dimension of development along with its geographical spread.

(3) UNDP's HDR considers the combined gross enrolments ratios in estimating the education index, since the data on net enrolment ratios are not available for all the countries included in the report. But in NHDR of India, the indicator *Intensity of Formal Education* is based on class-wise enrolment rates and it attempts to capture current progress in the spread of formal education among the school going children. This indicator not only values education in early years of an individual's life (as it looks at children in the school going age-group) but it lays importance on a structured formal system of education (unlike non-formal education as is generally the case with adult literacy) and, more importantly, weights progressively the capacity of the education system to retain enrolled students over successive classes from class I to XII. As a result, it implicitly takes care of the drop out rates across all classes. In constructing this indicator, a weighted average of the share of class-wise

enrolment in the total enrolment in classes I-XII is taken, the weights increasing over successive classes from I to 12. This is then adjusted by the gross enrolment ratio for the population of children in age-group of 6-18 years, to correct for the children in the school going age group who are not enrolled. The indicator so estimated, namely the ***Adjusted Intensity of Formal Education***, has a higher value for States that are able to have higher level of enrolments in higher classes or in other words are able to retain children in schools for a longer duration without dropping out and at the same time have a larger proportion of children of school going age-group enrolled in schools.

(4) As a summary measure, a composite index of diverse indicators, even when it is conceptually and methodologically difficult to put together, is a useful tool in policy planning. It also helps in facilitating comparisons inter-state as well as with other composite measures. While building composite indices from among the identified indicators for this Report, a major objective has been to develop a core set of indices that reflect, in some sense, the common concerns, social values and development priorities of all States. In the process, it permits a meaningful comparison of the human development status across States. In this context, it was felt necessary to have the core indices that are functionally decomposable at State and sub-State levels. The other concern, that had to be reflected in the indices, relates to their amenability to inter-temporal and inter-spatial analysis, as well as their sensitivity to tracking changes in development at more frequent interval of time. The latter implies using of such indicators also that are sensitive to capturing changes, for instance, on an annual basis, as against using those indicators that primarily capture the accumulated attainments on each of the identified dimensions of well being, that is included in the summary measure. Such a consideration is important when the objective is to have composite human development indices where frequent or yearly changes are not an account of changes

only in the income variable. This is not the case with the UNDP's HDI, which is presented annually in the HDRs. In their case the yearly changes in the value of the index is mostly on account of changes in the indicator on income per capita. The NHDR, like UNDP, also includes indicators that are sensitive to tracking gradual but continuous changes in such aspects of well being that have conventionally been captured largely through the slow moving indicators like life expectancy at birth or even literacy rates.

HDI and GEI – Departures from UNDP Indices		
UNDP-Indicators	**Attainments**	**NHDR-Indicators (India)**
Life Expectancy at birth	Longevity	Life Expectancy at age 1 and Infant Mortality Rate
Adult Literacy Rate combined with Enrollment ratio	Educational Attainment	Literacy Rate 7+ and Intensity of Formal Education
Real GDP Per Capita in PPP$	Economic Attainment	Per capital real consumption expenditure adjusted for inequality; Worker – population ratio in case of Gender Equality Index

Source: National Human Development Report, 2001, Planning Commission, Government of India, March, 2002

(5) While taking note of the social valuation and development priorities of India, the scaling and weighting of diverse indicators into a composite index has been done keeping in view the objectives for which the composite indices are being built. In scaling the diverse indicators, the main consideration has been to make attainments on each of them comparable and at the same time ensuring that the selection of end points, i.e., the maximum and the minimum values on the scale for each indicator are such that they support inter-temporal comparison for a reasonable period of time starting from 1980. The issue of weights to combine the identified indicators on each of the three dimensions of well being can be debated.

(6) The NHDR report of India has adopted a predominantly normative approach, as against a purely empirical basis of deriving weights to club different indicators. Conceptually, there are good reasons to suggest that different aspects of well-being have to be corealisable for an individual to have a meaningful sense of well-being in today's context. It follows that attainments on each aspect of well-being are equally important and hence should be equally weighted. Thus, in both HDI, as well as in HPI composite measures reflecting health, educational and economic attainments/deprivation have been equally weighted. However, within the composite measure on educational and on health attainments, based on sensitivity analysis, indicators with somewhat distinct attributes have been clubbed using unequal weights so as to reflect appropriately the country's context, development priorities and the desired policy focus. In case of the composite index on educational attainment, while adult literacy rates has been given a weight of 35 percent, the indicator capturing intensity of formal education (based on current enrollment rates in successive classes at school level) has been assigned 65 percent. As a result, unlike UNDP, the education index is capable of tracking development across the States and over the period of time for which they have been estimated.

Education Index of NHDR: Some Issues

The following issues and limitations arise which need corrective action:

(a) The development of education index comprises both qualitative and quantitative aspects. A number of variables, which affect the composite index, are overlooked. For example, expected life is directly dependent on food, nutrition, sanitation, hygiene, health care and health services. However, these aspects have been totally overlooked;

(b) The learning by doing and on the job training have been totally overlooked in constructing the education index.. However, whatever affects the quality of life and capacity to produce and enjoy is important element of welfare, and hence, should be considered while constructing the index; and

(c) While calculating the life expectancy, the distribution of people at all ages may be considered.

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