

Assessment of Human Development Index

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Preface

From the very beginning when its concept was developed during 1990s economic preference as a symptom of development was highly dominated. Over the time of its evolution a lot of human well-beings aspects were trying to incorporate. The HDI as a more meaningful measure of development is now quite well established. Its value, importance and relevance are also recognized. Does it mean that its imperfections are to be overlooked? Of course, is not. It shares the shortcomings of other composite indices. But the point is that the GDP is also a major composite indicator. If we can live with GDP for long history, the HDI, which is only few years old, deserves a chance.

Actually, GDP is a highly dominated factor for Development up to now. However, in computing HDI we treat equally with all the factors i.e., health, education, a decent standard of living factors. Human Development factors i.e., human assets index highly affected by economic vulnerability index related factors. So, to compute HDI all the relevant factors should be incorporate as far as possible.

All the human development composite indices and indicators including the HDI are in the process of evolution. With regard to the HDI, as has been pointed out, refinements have been made over the years both with regard to methodological issues as well as statistical sophistication.

Monitoring human development is important for assessment, policy making and enhancing lives of millions. The present state of art in monitoring is evolving slowly but surely. Research is going on – both within the Human Development Report Office and in academic and research institutions. In the last decade after 2010, however, a lot of improvement has been incorporate in computing HDI compare to 1990s. We have advanced quite a lot, but we have miles to go.

Ram Chandra Dhakal, Ph.D.

May 2013

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CHAPTER-ONE

Evolution of Human Development Index

1.1 Introduction:

If we look the historically evolution of human development index it was mostly perceived in terms of economic performance. We have too long been preoccupied with material production and there has been a search for a good measure of it. Basically per capita income has been proved to be a good measure and has dominated the scene ever since. The per capita income has chosen due to: be an attractive single indicator for assessing economic performance; be a useful indicator for dividing the world into groups - rich and poor, developed and developing – having a good criteria for allocating official development assistance at the international level; and finally, a good reliable and solid data on national income accounts were available to calculate per capita income. Over years, development perspective has changed. The first annual *Human Development Report (HDR)* and the introduction of the Human Development Index (HDI), *HDR 1990* presented the concept of “human development” as progress towards greater human well-being, and provided country-level data for a wide range of well-being indicators. Human Development Report (HDR), the development *perspective* has undergone a fundamental change.

Now-a-days, development is not about economic performance alone, but most importantly about people and their wellbeing. People are the ultimate objective of development. Economic growth is not an end by itself; it is a means to enhancing people’s lives. The benefits of growth must be translated into lives of people. There were naturally new searches for *measures* for human well-being and various human development indices and indicators evolved in these context.

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The basic objective of the evolution of the HDI was the outcome of reactions to needs and intellectual and policy demands and also it represented some proactive action setting the directions of new approaches. In tracing the evolution, the paper would not only be confined to historical or chronological developments, but it would also discuss the impacts of the HDI on policy-making, advocacy and future research. It will also attempt to identify the future challenges of the HDI which are facing today.

1.2 Need for new measure:

Actually, during the human development prospective, income measure alone cannot represent the whole aspect of development. The dynamic world demands the new change, exactly same happens in HDI, development paradigm that puts people at the centre of development. However, GNP (Gross National Product) per capita is a measure but unable to capture towards the aspect human lives.

In 1990, with the introduction of the concept of human development in the first HDR 1990, a fundamental difference was made in the way development is perceived. The concept of human development emphasized that

- Development is about enlarging people's choices by enhancing their functioning and capabilities.
- Development is *of* the people, *for* the people and *by* the people. The first refers to human capital formation and human resources development through nutrition, health and education. Development for the people stresses that the benefits of economic growth must be translated into lives of people. Development by the people means that people must be able to influence the process, which affects their lives.

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- Development must be woven around people, and not people around development.

And this changed perspective led to a fundamental difference in the way of development is to be measured and monitored. Since economic performance by itself cannot be the objective of development, neither can per capita income is a measure of it.

Under new perception of development – human development the search for such measures and their evolution over time concentrated on five aspects:

- Identification of a single summary measure of human development
- Construction of other composite indices which would go beyond measures of average achievements and assess aspects of gender inequality, deprivations in human development.
- Disaggregation of composite indices in terms of regions, states or provinces, races or ethnic groups, rural-urban divide, which may serve as mirrors to societies to assess trouble spots.
- Identification of indicators, beyond composite indices, and their innovative presentation which may supplement composite indices and highlight various aspects of human development.
- Search for new, improved, robust and reliable data to reflect meaningful and consistent human development indicators.

To identification of a single summary measure of human development, there is no such measure which measures correctly, purely, perfectly and fully support to advocacy and

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policy makers perfectly. In this regard the debate can be settled under the five criteria:

- Simplicity as simple is powerful and has more predictive potential
- Universality with a focus on basic capabilities and thus having applicability to both developed and developing countries
- Sufficient attractiveness drawing attention of policy makers, academics, development activists etc. It should represent a synthesis number and people should be emotionally attached to it.
- Pluralism and not mono-centricity.
- Synthesis with a focal attention among the information breadth of human development

The Human Development Index (HDI) is a measure of average achievement based on three components, namely, indicators of longevity, educational attainment and a decent standard of living, it is not exclusively focused on economic affluence (as the GNP is), and it certainly has served to broaden the empirical attention in assessing the process of development. During evaluation the HDI is not definitely a representative of 'happiness' or 'the best place on earth to live' but however compare to other discipline, the concept of human development is bigger and broader than any of its measure.

The analytical framework of the HDI can be discussed with respect to four issues related to the HDI : its focus, its variables, and its formula.

***Focus:** The focus of the HDI is to measure average achievements in human development in a society. It builds on three basic dimensions of human life – a long and healthy life, knowledge and a decent standard of living. The HDI measures basic human capabilities in these dimensions.

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Three issues can be raised with regard to its focus. First, does the concentration of the HDI on three basic dimensions of human life mean that other aspects of human life are unimportant?. The answer is: no. It just means that the basic capabilities are essential for human well-being and when they are achieved, doors for other opportunities open. Aspects like human rights, participation, non-discrimination, even though are not captured in the HDI, are essential for human development.

***Variable:** To represent the dimensions of human well-being included in the HDI, the following variables were chosen – *life expectancy at birth* for a long and lengthy life, *educational attainment* in terms of *adult literacy rate and combined gross enrollment ratio at primary, secondary and tertiary level* and GDP per capita (PPP\$) for a decent standard of living. There are three critical issues with regard to variables.

Scaling: In constructing the HDI, each variable is normalized through a process of scaling. In this process, for each variable, a maximum and a minimum value are selected and the difference between the maximum and the minimum value defines the scale. The normalized variable is constructed in the following way. First, the difference between the observed value and the minimum value is identified. This shows the path covered by the society in the selected variable. Second, this difference is shown as a proportion of the difference of the maximum value and the minimum value – a difference, which represents the total path to be covered by every society in the variable in question.

Thus the normalized variable, which is a pure number, shows for a particular variable, the path covered by a society as a proportion of the path to be covered. Thus if a society for a particular variable remains at the minimum, the normalized value of the variable will be 0 and if it has attained the maximum value, the normalized value of the variable will be 1. Thus the scale is set for each variable between 0 and 1.

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Scaling and the normalized value are required for two reasons. First, the variables included in the HDI have different units. Thus, life expectancy is in years, adult literacy rate is in percentages and the GDP per capita is in PPP US\$. By normalization, one gets rid of units and derives pure numbers. Such transformation is needed for additive purposes while constructing a composite index. Second, scaling enables one to carry on comparisons as to how in each dimension countries have fared relatively and what are the unfinished paths.

Weights: In the composite index, the variables of life expectancy at birth, educational attainment and GDP per capita are given equal weights. They are given equal weights not because of simplicity, but because of the philosophical reasoning that all the dimensions included in the HDI are equally important and desirable in their own rights for building human capabilities. Furthermore, there is no assumption of substitution among those dimensions or the variables representing them. Therefore, such a question as what is the amount of income that can be given up to get an additional year of life is irrelevant in the HDI framework. If there were substitution among the dimensions or the variables, then equal weights would not have made sense. But the absence of any substitution makes the assumption of equal weights defensible. In the HDI, there is, however, an assumption of transformation – education is transformed into knowledge and enhances human capabilities, income is transformed into other dimensions of human development not captured in the HDI.

Treatment of income: Income is a means to human development, not an end by itself. This dictates the way income enters into and is being treated in the HDI. Income enters into the HDI not in its own right, but as a proxy for all the dimensions not included in a long and healthy life and knowledge. The issue here is how income is transformed into enhancing human attainment in those areas.

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***Formula:** Once all the variables are normalized with all the necessary adjustments, a simple mean of them is taken, which is the HDI. The maximum value of the HDI is 1 and the minimum value is 0.

1.3 Improvements in the Methodology

From the outset of its introduction in 1990, the HDI caught the attention of academics, researchers, policy makers, and development activists. It was praised for its broader perspective of human well-being, yet it was seriously scrutinized in terms of its analytical framework, methodology, data etc. There have been several academic critiques of the index, reviewing its internal consistency, robustness, predictive power. In academic journals, articles focusing on the index started to appear. Most of these articles were constructive criticism of the HDI and suggested different refinements to the methodology of the index. Policy makers were also interested in seeing whether in diverse situations the index can still be applied as useful policy guide. Development activists were concerned with more innovative use of the index for advocacy purposes.

As a result, the index underwent a series of analytical and methodological refinements. When the HDI was first introduced in the Human Development Report 1990, it had the following five characteristics. First, the HDI was constructed from a derivational perspective. The composite of average deprivation was identified first going through deprivations in each variable and then the HDI was represented as 1 minus composite average deprivation. It reflected a round about way of deriving the HDI. Second, in the educational attainment component, there was only one variable – adult literacy rate. Third, in terms of discounting income, income, irrespective of levels, was logged. Fourth, for each variable, the maximum and minimum were observed ones. Fifth, the HDI was constructed only for 130 countries.

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Over the years with better understanding of issues, academic reactions, policy responses, demands from development activists, the HDI has undergone a series of methodological refinements. The major refinements are the following:

Direct calculation of the HDI: Starting from 1991, the HDI began to be calculated directly to avoid the roundabout way and also to give it a positive spin. That tradition still continues.

Educational attainment variable: In the HDR 1991, mean years of schooling was added as a second component to adult literacy to form the variable for educational attainment. A second variable was included to have a sense of educational attainment of people not covered by adult literacy. Adult literacy was given two-thirds weight and mean years of schooling one-third weight, as adult literacy is more representative of stock variable for attainment. But the mean years of schooling were constructed in a fuzzy way and some of the data do not seem to be reflecting the reality. Therefore, in 1995, it was replaced by combined gross enrolment at primary, secondary and tertiary level.

Maxima and minima: Till 1994, in normalizing variables, observed maxima and minima were used. It created to serious problem. First, there was no way of knowing whether the changes in the HDI value of a country are because of its improved performance or because of changing the goal posts. Second, since the observed maxima and minima change from year to year, representing changes in goal posts themselves, any meaningful inter-temporal comparison was not possible.

To deal with these issues, in 1994, fixed maxima and minima were introduced. These were no longer observed, but rather based on the trends of the variables, and their probable values in next 25 years. Fixing the maxima and minima for

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variables made it possible to carry out meaningful trend analysis of the HDI.

Treatment of income: Even though in 1990, income was logged in the HDI, for the next eight years, income above a cut-off point was adjusted drastically using a highly regressive formulation. Three observations are pertinent to this adjustment. First, the cut-off point was the average world income on the assumption that every person as a member of the global community should have at least this level of income for building basic capabilities. Second, the adjustment was so drastic that \$35,000 (above the \$5,000 cut-off point) is reduced to \$321 by this adjustment. Third, this formulation punishes middle income countries unduly.

In order to rectify all these, the formulation of logging income all through was again introduced in 1999. The advantages of this approach are it is not as drastic as the other one and it does not unduly penalizes middle income countries as the asymptote starts quite late.

1.4 Achievements of the HDI

Over the years, the HDI in policy decision has significant achievement in various ways. Five major distinctive achievements of HDI are as follows:

- * Income is not the sum total of human life and thus per capita income cannot be the measure of human-well-being. This perspective has changed the way development is looked at and analyzed and today development is viewed broader than economic growth. As a result, development with a human face has no longer remained bombast; rather the new paradigm has

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had implications for policies, resource allocations and institution building.

- The HDI has started a desirable healthy competition among countries to surpass its neighbours and competitors in rankings. With the publication of each year's HDR, the first thing that draws attention of different quarters is the ranking of a relevant country for the ranking of its favourite neighbour.
- It has served as an instrument of public communication with a strong advocacy role and it has contributed significantly to policy debates and dialogues. Therefore, NGOs and institutions of civil society in different countries have used it for highlighting their demands and pressing the governments on various issues.
- The HDI has led to various exercises for monitoring and evaluation and also for generation of more systematic and reliable data. At the global level, whether in the area of monitoring Millennium Development Goals or the UN-wide Common Country Assessment (CCA) Framework, the HDI has been used to provide contextual information. In Kuwait, the Ministry of Planning, with the help of the HDI, has started to monitor human development and incorporate it in its indicators for strategic planning.
- It has resulted in serious academic research and empirical studies on the issue of theoretical refinements and statistical sophistication of the HDI. The academic research not only concentrated on a substantive review of

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the index – its consistency, statistical properties, its robustness, its predictive power, but also suggested various refinements in its present form. Some of the research has also concentrated on the issue of including other dimensions of human development in the index.

Over the years, it has been seen that HDI has become unable captured some important concepts exactly. Among these some are as follows:

- The HDI is not a perfect index. There is no justification that HDI fully and perfectly captures the whole human development over the years.
- Basically HDI has concentrated on three dimensions of basic capabilities- a long and healthy life, knowledge and a decent standard of living. The other aspects of human life, such as participation, political freedom, human security which are equally important, are not included in HDI. However, the achievement of three basic capabilities they would upon up opportunities in other dimensions of human lives.
- The HDI is just a summary measure. It is not a comprehensive measure of human development in any situation. It has not sufficient information for assessment as human development indicators in any society.

Beyond the HDI

After introducing the concepts of HDI, in few years, it has appeared as a useful policy tool in terms of average measure of human development. At the same time it cannot solve other aspects of human development such as distribution aspect, derivational aspect etc.

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Gender-related Development Index and Gender Empowerment Measure

After 1990, a Gender-related development Index (GDI) and a Gender Empowerment Measure (GEM) emerged in 1995 to take into account gender inequality in achievement of basic capabilities (GDI) and gender inequality in opportunities in economic and political areas (GEM).

The greater the gender disparity in human development, the lower is a country's GDI compared to its HDI. The GDI is simply the HDI, or adjusted downwards, for gender inequality. The GEM indicates whether women are able to actively participate in economic and political life. It focuses on participation, measuring gender inequality in key areas of economic and political participation and decision-making. Thus the objectives of GDI and GEM have established that greater gender equality in building human capabilities or providing opportunities to women does not depend on income level or stage of development. And it can be achieved across a range of cultures.

These two indicators have served as following purposes:

- The GDI shows the average degree of gender inequality which is the social reflection of the concerned society.
- Both these indicators are the useful advocacy tool of feminist activists and civil society movements.
- These two indicators are relevant in making policy related to women

1.5 Human Poverty Index (HPI)

Poverty is a multi-dimensional by nature. A composite measure for multi-dimensional poverty in terms of Human Poverty Index (HPI) was introduced in 1997.. The idea was introduced to look at human development from as derivational aspect and the other

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to assess how the benefits of human development – as measured by the average achievements represented by the HDI - are distributed. The critic says that it is basically measures shortfalls in average achievements, but it cannot reflect the above two issues. The HPI was constructed both for developing countries (HPI-1) in 1997 and for industrial countries (HPI-2) in 1998.

HPI-1 measure for the issues of developing countries where deprivation in long and healthy life is measured by percentage of people born today, but are not expected to survive to age 40, deprivation in knowledge by adult illiteracy rate, and deprivation in economic provisioning by the percentage of people lacking access to health services and safe water and percentage of children under five who are malnourished. While HPI-2 be the indicator for developing counties where the deprivation in long and healthy life is measured by the percentage of people born today, but are not expected to survive age 60, deprivation in knowledge by percentage of adults functionally illiterate, deprivation in economic provisioning by income poverty incidence and deprivation in social inclusion by long-term unemployment.

The purposes of these indicators were:

- They provided a single measure of the multidimensionality of poverty though it may not be perfect and also established that if income is not the sum total of human lives, lack of it cannot be that sum total of human deprivation. They have been effective in showing the distribution of the average achievements of human development.
- In fact, poverty is not only a southern phenomenon it is northern problem as well but nature between these two may differ.

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- HPI-2 enabled us to differentiate the human development situation among countries whose average achievements in human development are extremely close. A high human development does not automatically imply low levels of human deprivation.

CHAPTER-TWO

Human Development Index: Methodology and Measurement

2.1 Introduction

From the very beginning of 1990 human development report raised a basic distinction needs to be made between the means and ends of development. Actually, human beings are the real ends of all activities and development must be centered on enhancing their achievements, freedoms and capabilities. Income, commodities, and wealth have instrumental importance but they do not constitute a direct measure of the living standard itself.

The human development approach value capabilities related to health nutrition and basic education as end themselves and income only as a means to achieve these. Thus, human resource development is based on precisely the opposite valuation. Actually the assesses investment in human capital including health, nutrition, and education, entirely in terms of the extra income or output the investment generates, judging it to be valuable if the rate of return exceeds the capital cost.

The common measures of group performance tend to be aggregative indicators that are based on averaging the individual circumstances. In such situation there will be loss of some valuable information. Generally the distribution-sensitive measures could not be used in aggregate indicators based on simple averages.

The human development index in 1990 had set three components, dealing respectively with (1) life expectancy birth, (2) the proportion of literacy among the adult population and (3) the logarithm of the gross product (up to the level of the

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internationally fixed poverty line). Of the three, both life expectancy and literacy can be seen to be valuable in themselves (even though they may also be useful for pursuing other ends too). Income, however, is quintessentially a means to other ends. The case for a distribution-sensitive measure of incomes can, therefore, be very firmly linked both with the efficiency and equity arguments for equality.

A more equal distribution of income would generate more desirable ends (such as utilities, capabilities, and so on), but can also serve to bring about a more equal distribution of these end-variables, given a homogeneous population.

The use of the logarithm of income can serve, to some extent, the purpose of equality preference on either or both grounds, since it is a strictly concave transformation, and the average of the logarithms of incomes tends to increase as the given total income is more equally distributed. However, in the actual use of this formula in UNDP (1990) the logarithmic transformation was applied not to the individual incomes but to the average income of the nation, and this immediately obliterates that possibility of equality – preference in assessing the national situation. The unfortunate fact, however, is that the information we have on individual incomes is very limited indeed for most countries, so that any attempt to use such a distributive correction on the basis of detailed individual income data is bound to be unrealistic at the present time. This is not only respect in which practical feasibility limits the scope for using more adequate criteria of human development, and the compromises reflect what can be sensibly done here and now.

However, in the context of the more advanced countries (such as those in North America or in Europe or Japan), the

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distributional information is much better. This is among the arguments for trying to do some additional analysis for a particular group of countries, even though the same exercise would not be useful for another group. There is a case for using the distributional measures available for more advanced countries to correct the figures for GDP per capita, and this is what is being done in this 1993 Human Development Report. In taking note of inequality in the distribution of incomes, it is possible to use various alternative measures of inequality. Perhaps the most widely available information on income distribution is that given by the Gini coefficient. This measure of inequality has many limitations, and it is not particularly easy to use in building up an overall picture of inequality on the basis of inequalities within and between groups.

On the other hand, it does also have some merit in terms of conceptual understandability and axiomatic interpretation. It can even be shown that calculated with appropriate price indices, a view of social welfare based on rank – order weighted individual income levels is well expressed by a Gini-corrected mean national income. That is, when G is the Gini coefficient, and m is the mean national income, the average income corrected by rank-order weights, W .

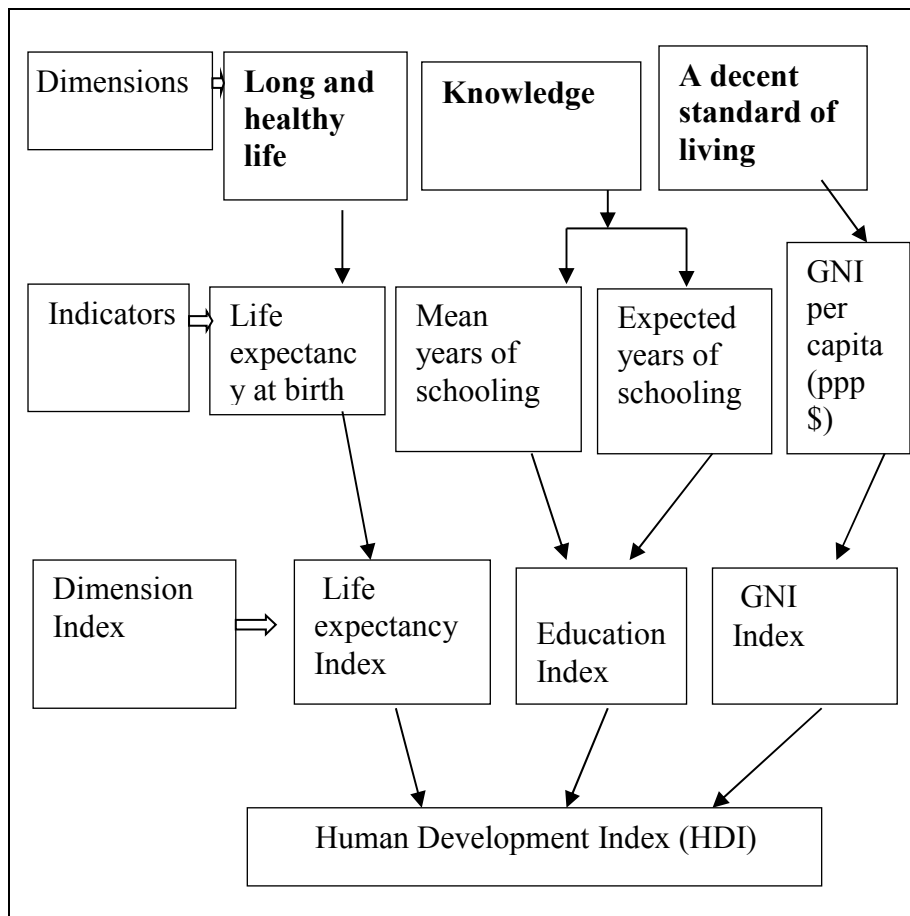
In 2005, as in 1990, the HDI is the heart of the *HDRs*. HDI is a measure of human development that combines proxies for three important human capabilities: health, education, and a decent standard of living. Health (H) is represented by life expectancy (LE), education by literacy (LIT) and school enrollment (ENR) (the literacy and school enrollment indices are combined in weighted average as the education (E) index), and standard of living by GDP per capita (Y).

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2.2 Concept and method of Human Development Index

The various concepts and their methods have been used to

Box-1
Human Development Index (HDI)
Source: HRD--2013



compute human development index will be explained in this portion of the chapter which are as follows:

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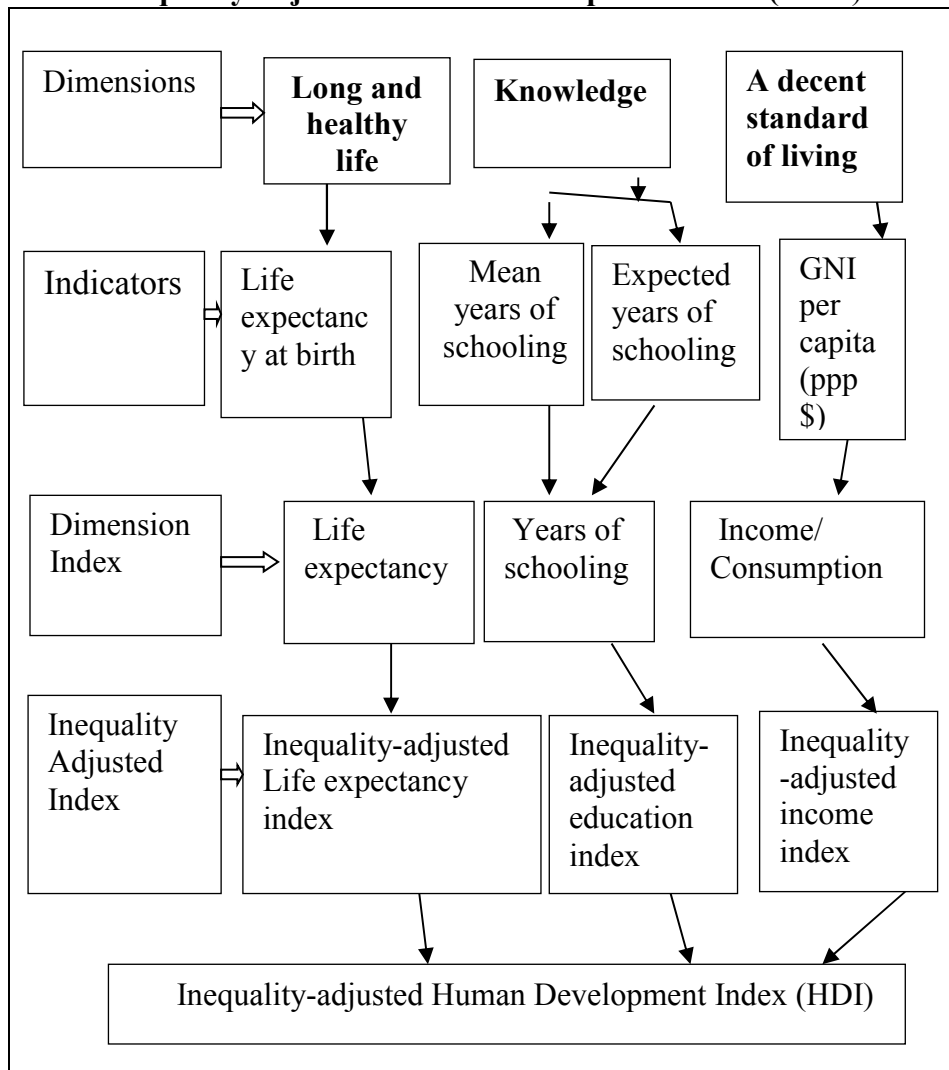
The value for each these components is transformed into an index using a normalization formula in which the actual value is compared to a stylized range of values across all countries:

In Box-1, human development Index has been shown in terms of Dimension, Indicators and Dimension Index. Dimensions is further classified into three category: long and healthy life, knowledge and a decent standard of living; the indicator of the long and healthy life is the life expectancy at birth, while knowledge includes mean years of schooling and expected years of schooling as indicators and GNI per capita in terms of purchasing power parity in US \$ be the indicator of decent standard of living. The life expectancy index shows the dimension index of long and healthy life. Similarly, The combination of mean years of schooling and expected years of schooling is education index and GNI index obtained from GNI per capita in terms of purchasing power parity in US \$ is known as dimension index of decent standard of living. The combination of three dimension indices gives Human Development Index (HDI) at present context.

In Box-2, dimensions and indicators classification be same in inequality-adjusted human development index as shown in Box-1 for human development index. In box-2, life expectancy produces Inequality –adjusted life expectancy index while years of schooling gives inequality adjusted education index and income/consumption gives inequality adjusted income index. Thus, the combination of these three indices be Inequality-adjusted Human Development Index (IHDI)

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Box-2
Inequality-adjusted Human Development Index (IHDI)



Source: HRD--2013

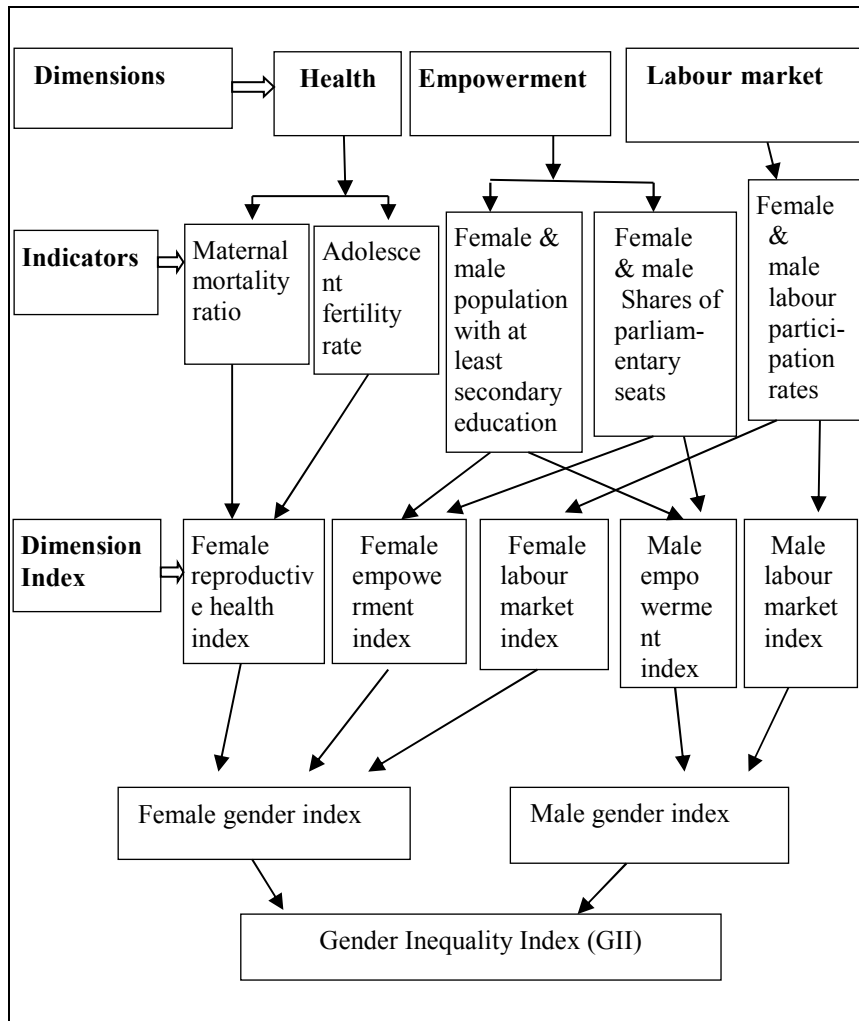
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Firstly, we can classify the gender inequality index in terms of qualitative form they are health, empowerment and labour market. The indicator of health depends upon maternal mortality ratio and adolescent fertility rate. On the other hand, empowerment reflects its indicator how these two behave on female and male participation with at least secondary education and female and male shares of parliamentary seats. Maternal mortality ratio and adolescent fertility rate shows the female reproductive health index which is known as dimension index of health. Female population with at least secondary education and its shares in parliamentary seats shows female empowerment index and likewise, Male population with at least secondary education and its shares in parliamentary seats shows male empowerment index. Similarly, female participation rates in labour market are its market index, while for male, the participation rates in labour market be its market index. Female reproductive health, female empowerment index and female labour market index give the status of female gender index in average form for the particular country. For male, its empowerment index and its labour market index produces male gender index. Thus the product of female gender index and male gender index is Gender Inequality

Index (GII) (Box-3). The Gender Inequality Index has been designed to overcome the most important limitations of the and GEM, so it has proposed both new dimensions to capture gender inequality and a new methodology to aggregate multidimensional information into a single dimensional measure that can be eventually used to compare countries performance over time. The dimensions of multi-dimensional poverty index are health, education and standard of living. Nutrition child mortality, years of schooling, children enrolled and cooking fuel, toilet, water, electricity, floor, assets are the indicators of MPI

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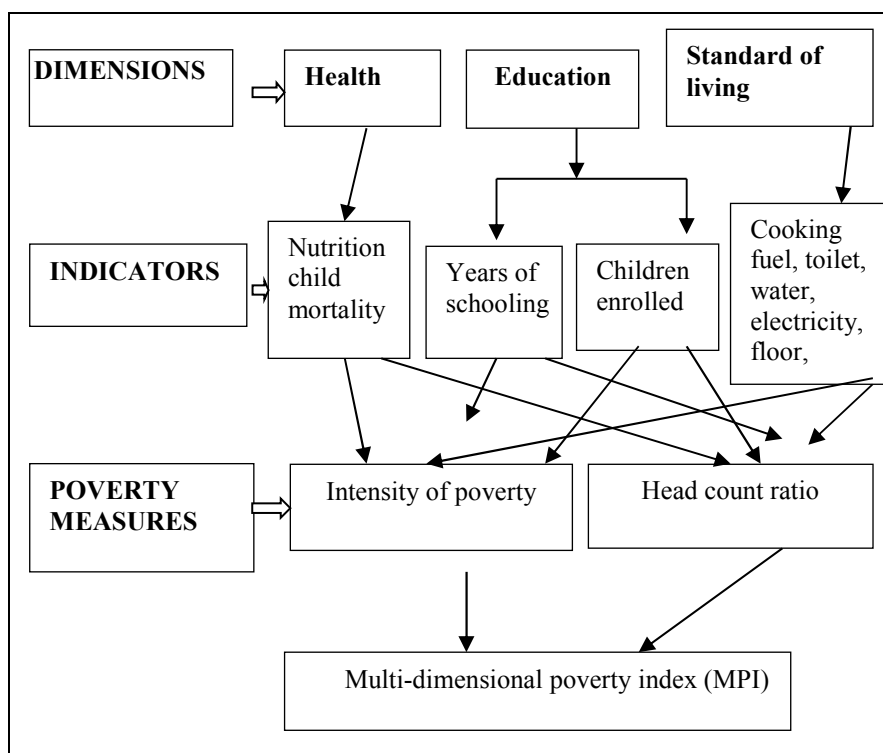
**Box-3
Gender Inequality Index (GII)**



Source: HRD--2013

These indicators supply the poverty measures in terms of intensity of poverty and head count ratio. The combination of these two produces Multi-dimensional Poverty Index (MPI) (Box-4)

**Box-4
Multi-dimensional Poverty Index (MPI)**



Source: HRD--2013

The per capita GDPs used in the income index are in U.S. dollars and are purchasing power. The Human Development Index (HDI) is a summary measure of key dimensions 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 from each of these three dimensions. For a full elaboration of the method and its rationale, see Klugman, Rodriguez and Choi (2011). This technical note describes the steps to calculate the HDI, data sources and the methodology used to express income.

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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 (1980–2012). 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 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.

After defining the maximum and minimum values the relative measure as sub-indices can be calculated by:

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

For education, equation 1 is applied to each of the two subcomponents, 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.

2.3 Calculation Formulae of Index

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 (Anand and Sen 2000). Thus, for income the natural logarithm of the actual, minimum and maximum values is used.

HDI be the cubic root of the product of life index, educational index and income index i. e. three dimensions index.

$$\text{HDI} = \sqrt[3]{I_{\text{Life}} \cdot I_{\text{Education}} \cdot I_{\text{Income}}}$$

Sub-indices can be calculated by

Life expectancy index = $(le - le_{min}) / (le_{max} - le_{min})$

Where: le = life expectancy of the particular country

Mean years of schooling index = $\left[\frac{mys - mys_{min}}{mys_{max} - mys_{min}} \right]^{1/2}$

Expected years of schooling index = $\left[\frac{eys - eys_{min}}{eys_{max} - eys_{min}} \right]^{1/2}$

Where: mys = Mean years of schooling and eys = Expected years of schooling

Education index = $\left[\frac{(mys - mys_{min})}{(mys_{max} - mys_{min})} * \frac{(eys - eys_{min})}{(eys_{max} - eys_{min})} \right]^{1/2}$

Income index = $[\ln(gni) - \ln(gni_{min})] / [\ln(gni_{max}) - \ln(gni_{min})]$

where : gni = gross national income per capita ; nl = natural logarithm

GNI is traditionally expressed in current monetary terms. 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.

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Official PPPs are produced by the International Comparison Program (ICP), which periodically collects thousands of prices of matched goods and services in many countries. The last round of this exercise refers to 2005 and covers 146 countries. The 2011 round will produce new estimates by the end of 2013. 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.

The Inequality-adjusted Human Development Index (IHDI) adjusts the Human Development Index (HDI) for inequality in the distribution of each dimension across the population. It is based on a distribution-sensitive class of composite indices proposed by Foster, Lopez-Calva and Szekely (2005), which draws on the Atkinson (1970) family of inequality measures. It is computed as a geometric mean of geometric means, calculated across the population for each dimension separately.

The IHDI accounts for inequalities in HDI dimensions by “discounting” each dimension’s average value according to its level of inequality. The IHDI equals the HDI when there is no inequality across people but falls further below the HDI as inequality rises. In this sense, the IHDI is the actual level of human development (taking into account inequality), while the HDI can be viewed as an index of the “potential” human development that could be achieved if there was no inequality. The “loss” in potential human development due to inequality is the difference between the HDI and the IHDI and is expressed as a percentage.

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Inequality in the distribution of HDI dimensions is estimated for-Life expectancy, using data from abridged life tables, the age intervals (0–1, 1–5, 5–10, ... , 85+) with the mortality rates and average age at death specified for each interval. Similarly, Mean years of schooling, using household survey data harmonized in international databases, including the Luxembourg Income

Study, Eurostat's Income and Living Conditions, the World Bank's International Income Distribution Database, the United Nations Children's Fund's Multiple Indicators Cluster Survey, ICF Macro's Demographic and Health Survey and the United Nations University's World Income Inequality Database.

Disposable household income or consumption per capita using the above listed databases and household surveys—or for a few countries, income imputed based on an asset index matching methodology using household survey asset indices.

IHDI draws on the Atkinson's family of inequality measures and sets the aversion parameter e equal to 1. In this case the inequality measure is $A = 1 - g/\mu$, where g is the geometric mean and μ is the arithmetic mean of the distribution.

$$A_x = 1 - \frac{\sqrt[n]{X_1 \cdot X_2 \dots X_n}}{\bar{X}}$$

Where $\{X_1, X_2, \dots, X_n\}$ denotes the underlying distribution in the dimensions of interest. A_x is obtained for each variable (life expectancy, mean years of schooling and disposable income or consumption per capita). X The geometric mean in equation 1 does not allow zero values. For mean years of schooling one year is added to all valid observations to compute the inequality. Income per capita outliers—extremely high incomes as well as negative and zero incomes—were dealt with by truncating the top 0.5 percentile of the distribution to reduce the influence of Extremely high incomes and by

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replacing the negative and zero incomes with the minimum value of the bottom 0.5 percentile of the distribution of positive incomes.

Mean achievement can be written as

$\bar{X} \cdot (1 - A_x) = \sqrt[n]{X_1 \cdot X_2 \dots X_n}$ Thus the geometric mean represents the arithmetic mean reduced by the inequality in distribution.

The inequality-adjusted dimension indices are obtained from the HDI dimension indices, I_x , by multiplying them by $(1 - A_x)$ where A_x , defined by equation 1, is the corresponding Atkinson measure:

$$I_x^* = (1 - A_x) \cdot I_x$$

The inequality-adjusted income index, I_{Income}^* is actually an adjusted index of the unlogged income values, I_{Income} . This enables the IHDI to account for the full effect of income inequality.

The IHDI is the geometric mean of the three dimension indices adjusted for inequality. First, the IHDI that includes the unlogged income index (IHDI*) is calculated:

$$\begin{aligned} IHDI^* &= \sqrt[3]{I_{Life}^* \cdot I_{Education}^* \cdot I_{Income}^*} \\ &= \sqrt[3]{(1 - A_{Life}) \cdot I_{Life} \cdot (1 - A_{Education}) \cdot I_{Education} \cdot (1 - A_{Income}) \cdot I_{Income}} \end{aligned}$$

The HDI based on unlogged income index (HDI*) is then calculated:

$$HDI^* = \sqrt[3]{I_{Life} \cdot I_{Education} \cdot I_{Income}}$$

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The percentage loss in the HDI* due to inequalities in each dimension is calculated as:

$$Loss = \frac{IHDI^*}{HDI^*} = 1 - \sqrt[3]{(1 - A_{Life})(1 - A_{Education})(1 - A_{Income})}$$

The percentage loss due to inequality in income distribution is the same for both average income and its logarithm, the IHDI is then calculated as:

$$Loss = \frac{IHDI^*}{HDI^*} = 1 - \sqrt[3]{(1 - A_{Life})(1 - A_{Education})(1 - A_{Income})}$$

Aggregating across dimensions for each gender group by the geometric mean makes the GII association sensitive for women and girls the aggregative formula is

$$G_F = \sqrt[3]{\left(\frac{10}{MMR} \times \frac{1}{AFR}\right)^{1/2} \times (PR_F \times SE_F)^{1/2} \times LFPR_F}$$

and for each men and boys is

$$G_M = \sqrt[3]{1 \times (PR_M \times SE_M)^{1/2} \times LFPR_M}$$

The female and male indices are aggregated by the harmonic mean to create the equally distributed gender index

$$HARM(G_F, G_M) = \left[\frac{(G_F)^{-1} + (G_M)^{-1}}{2} \right]^{-1}$$

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The reference standard for computing inequality is obtained by aggregating female and male indices using equal weights and then aggregating the indices across dimensions:

$$G_{\bar{F},\bar{M}} = \sqrt[3]{\overline{Health} \cdot \overline{Empowerment} \cdot \overline{LFPR}}$$

$$\text{Where, } \overline{Health} = \left(\sqrt{\frac{10}{MMR} \cdot \frac{1}{AFR}} + 1 \right) / 2$$

$$\overline{Empowerment} = \left(\sqrt{PR_F SE_F} + \sqrt{PR_M SE_M} \right) / 2$$

$$\overline{LFPR} = \frac{LFPR_F + LFPR_M}{2}$$

Comparing the equally distributed gender index to the reference standard yields the GII,

$$GII = 1 - \frac{HARM(G_F, G_M)}{G_{\bar{F},\bar{M}}}$$

The Multidimensional Poverty Index (MPI) identifies multiple deprivations at the individual level in education, health and standard of living. It uses micro data from household surveys. To compute MPI, we have used certain methodology. According to it, Each person is assigned a deprivation score according to his or her household's deprivations in each of the 10 component indicators. The maximum score is 100%, with each dimension equally weighted; thus the maximum score in each dimension is 33.3%. The education and health dimensions have two indicators each, so each component is worth 33/2, or 16.7%. The standard of living dimension has six indicators, so each component is worth 33.6/6, or 5.6%.

The analysis is based on following thresholds:

Education: having no household member who has completed five years of schooling and having at least one school-age child (up to grade 8) who is not attending school.

Health: having at least one household member who is mal-nourished and having had one or more children die.

Standard of living: not having electricity, not having access to clean drinking water, not having access to adequate sanitation, using “dirty” cooking fuel (dung, wood or charcoal), having a home with a dirt floor, and owning no car, truck or similar motorized vehicle while owning at most one of these assets: bicycle, motorcycle, radio, refrigerator, telephone or television.

To identify the multi-dimensionally poor, the deprivation scores for each household are summed to obtain the household deprivation. A cut-off of 33.3%, which is the equivalent of one-third of the weighted indicators, is used to distinguish between the poor and non-poor. If c is 33.3% or greater, that household (and everyone in it) is multi-dimensionally poor. Households with a deprivation score greater than or equal to 20% but less than 33.3% are vulnerable to or at risk of becoming multi-dimensionally poor. Households with a deprivation score of 50% or higher are severely multi-dimensionally poor.

The MPI value is the mean of deprivation scores c (above 33.3%) for the population and can be expressed as a product of two measures: the multidimensional headcount ratio and the intensity (or breadth) of poverty.

The headcount ratio, H , is the proportion of the population who are multi-dimensionally poor in form of

$$H = \frac{q}{n}$$

Where q is the number of people who are multi-dimensionally poor and n is the total population.

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The intensity of poverty, A , reflects the proportion of the weighted component indicators in which, on average, poor people are deprived. For poor households only (c greater than or equal to 33.3%), the deprivation scores are summed and divided by the total number of poor persons. Thus the formula form to show the intensity of poverty is:

$$A = \frac{\sum_1^q c}{q}$$

Where c is the deprivation score that the poor actually experience.

The deprivation score c of a poor person can be expressed as the sum of deprivations in each dimension j ($j = 1, 2, 3$), $c = c_1 + c_2 + c_3$.

The contribution of dimension j to multidimensional poverty 3 can be expressed as

$$\text{Contrib}_j = \frac{(\sum_1^q c_j)/n}{MPI}$$

2.4 Some Examples

$$\text{Dimensional-Index} = \frac{\text{Actualvalue} - \text{Minimumvalue}}{\text{Maximumvalue} - \text{minimumvalue}}$$

Dimensions

$$\text{minimum} = 0, \text{maximum} = 1,$$

$$\text{observed-years} = 1980 - 2011$$

$$\text{education-minimum} = 0, \text{ob.Mean-yrs-of-schooling} = 13.1 \text{ yrs}$$

$$\text{min.life-expectancy} = 20 \text{ yrs}, \text{ob.Expected-yrs-of-schooling} = 18 \text{ yrs}$$

$$\text{per-capita-GNI-minimum-income} = \$100, \text{oblife-expect} = 83.4 \text{ yrs}$$

$$\text{per-capita-GNI-max-income} = \$107721$$

$$HDI = \sqrt[3]{I_{\text{life}} \times I_{\text{Education}} \times I_{\text{Income}}}$$

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In creating dimension index, we set as

- Minimum and maximum values ranges (0 and 1)
- Maximum are the highest observed values in the time series (1980-2011).
- Minimum values are appropriately subsistence values.
- Minimum values are set at 20yrs for life expectancy.

Example of a country –X

indicators – – – – – = value

life – exp ec tan cy – at – birth = 75.2

mean – years – of – schooling(yrs) = 5.5

Expected – years – of – schooling(yrs) = 10.4

GNI – per – capita(PPPS) = 2,805

$$\text{Life – exp ec tan cy – index} = \frac{75.2 - 20}{83.4 - 20} = 0.870$$

$$\text{mean – yrs – of schooling – index} = \frac{5.5 - 0}{13.1 - 0} = 0.478$$

$$\text{Expected – yrs – of – schooling – index} = \frac{10.4 - 0}{18 - 0} = 0.576$$

$$\text{Education – Index} = \frac{\sqrt{0.478 \times 0.576} - 0}{0.978 - 0} = 0.503$$

$$\text{Income – index} = \frac{\ln(2,805) - \ln(100)}{\ln(107,721) - \ln(100)} = 0.478$$

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

Inequality-adjusted Human Development Index of a country after calculating the HDI which is already computed for

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a country-X explain above using same technique we can compute IHDI as follows for another country say Y:

$$\begin{aligned} IHDI &= \left(\frac{IHDI^*}{HDI^*} \right) \cdot HDI = \sqrt[3]{(1 - A_{Life})(1 - A_{Education})(1 - A_{Income})} \cdot HDI \\ &= 0.359 \times \sqrt[3]{0.728 \times 0.535 \times 0.054} = 0.275 \end{aligned}$$

$$\text{Loss percentage} = 1 - 0.275/0.359 = 0.232$$

Calculating the Gender Inequality Index (GII)

- GII reflects three dimensions- i) reproductive health, ii) empowerment and iii) the labour market
- The index shows the loss in potential human development due to inequality between female and male achievements in the dimensions.
- It varies between 0 when women and men fare equally and 1 when one gender fare as poorly as possible in all measured dimensions.
- The index is based on the general mean of general means of different orders – the first aggregation is by the geometric mean across dimensions: these means, calculated separately for women and men, are then aggregated using a harmonic mean across genders.
- GM cannot have zero value, so minimum is 0.1
- Adolescent fertility rate, share of parliamentary seats, attainment at secondary and higher education levels may be zero but coded as 0.1
- For women and girls, the aggregation formula is:

$$G_F = \sqrt[3]{\left(\frac{10}{MMR} \times \frac{1}{AFR}\right)^{1/2} \times (PR_F \times SE_F)^{1/2} \times LFPR_F}$$

- And for men and boys the formula is:

$$G_M = \sqrt[3]{1 \times (PR_M \times SE_M)^{1/2} \times LFPR_M}$$

Where

G= geometric mean; MMR=maternal mortality rate;
 AFR=adolescent fertility rate, SE=secondary education; PR=
 parliamentary seat; LFPR= labour force participation rate
 M= male, F= female

- Male and female indices are aggregated by harmonic mean to create equally distributed gender index:

$$HARM(G_F, G_M) = \left[\frac{(G_F)^{-1} + (G_M)^{-1}}{2} \right]^{-1}$$

- Using the harmonic mean of geometric means within groups captures the inequality between genders.
- The reference standard for computing inequality is obtained by aggregating female and male indices using equal weights and then aggregating the indices across the dimensions will be:
- Geometric mean of the arithmetic means for each indicator

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$$G_{\bar{F}, \bar{M}} = \sqrt[3]{\overline{Health} \times \overline{Empowerment} \times \overline{LFPR}}$$

Where

$$\overline{Health} = \left(\sqrt{\frac{10}{MMR} \times \frac{1}{AFR}} + 1 \right) / 2,$$

$$\overline{Empowerment} = \left(\sqrt{PR_M \times SE_M} + \sqrt{PR_F \times SE_F} \right) / 2$$

$$\overline{LFPR} = \frac{LFPR_M + LFPR_F}{2}$$

Gender inequality index

Comparing the equally distributed gender index to the reference standard yields the GII

$$1 - \frac{HARM(G_F, G_M)}{G_{\bar{F}, \bar{M}}}$$

Example of a country say A: maternal mortality ratio= 530, Adolescent fertility ratio= 73.5, parliamentary representation (female)= 0.229 and for Male is 0.771, attainment at secondary and higher education female=0.243 and for male = 0.203, Labour market participation ratio for female =0.719 and for male =0.787,

$$\overline{Health} = \left(\sqrt{\frac{10}{530} \times \frac{1}{73.5}} + 1 \right) / 2 = 0.508$$

$$\overline{Empowerment} = \frac{\sqrt{0.229 \times 0.243} + \sqrt{0.771 \times 0.203}}{2} = 0.316$$

$$\overline{LFPR} = \frac{0.719 + 0.787}{2} = 0.743$$

Using the above formulae we can obtain in the following form:

- Geometric means are

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$$G_F = \sqrt[3]{\sqrt{\frac{10}{530} \times \frac{1}{73.5}} \times \sqrt{0.229 \times 0.243 \times 0.719}} = 0.134$$

$$G_M = \sqrt[3]{1 \times \sqrt{0.771 \times 0.203 \times 0.787}} = 0.675$$

$$G_{F,M} = \sqrt[3]{0.508 \times 0.316 \times 0.743} = 0.492$$

$$HARM(G_F, G_M) = \left[\frac{1}{2} \left(\frac{1}{0.134} + \frac{1}{0.675} \right) \right]^{-1} = 0.230$$

$$\therefore GHI = 1 - (0.230 / 0.492) = 0.532$$

Multi-dimensional Poverty Index (MPI):

It is a new-concept developed by UNDP to measure the poverty status in the development and especially in less development countries the world. The method, to measure poverty, will be discussed taking some hypothetic example. Here in following about procedure will be explained briefly:

- It belongs to at the individual level in education, health and standard of living ,
- It uses micro data from household surveys
- The max score is 100 with each dimension treated as equally I,e, 33.3 percent
- The education and health dimensions have two indicators each, so each component is worth 16.5 percent.
- Standard of living has six indicators weight of each component is 5.6 percent.

Thresholds are as follows

- **Education**-having no household member who has completed five years of schooling and having at least one schooling-age child (up to grade 8) who is not attaining school.

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- **Health-** having at least one household member who is malnourished and having had one or more children die.
- **Standard of living** – not having electricity, not having access to clean drinking water, not having access to adequate sanitation, using “dirty”
- Cooking fuel (dung, wood or charcoal), having a home with a dirty floor, and owing no car, truck or similar motorized vehicle while owning at most one of these assets: bicycle, motorcycle, radio, refrigerator, telephone or television.
- If any household has greater than one third of the weight of the indicators or more than 33.3 percent that household is multidimensionality poor. Similarly, a deprivation score greater than or equal to 20 percent but less than 33.3 percent are vulnerable to or at risk of becoming multidimensionality poor.
- A household score is greater than 50 percent or more are severely multidimensionality poor.
- MPI has two measures:
 - i) Multidimensional head count ratio
 - ii) intensity of poverty
- H be proportion of the population who are multidimensionality poor.
- $H=q/n$ where q be multidimensionality poor and n is the total population

Intensity of poverty:

- The proportion of the weighted component indicators in which on average poor people are deprived. Poor household only, the deprived scores are summed and divided by the total number of poor persons

$$A = \frac{\sum_1^q c}{q}$$

Where c is deprivation score the poor experience.

To measure the poverty index, taking a hypothetical example of a village, assuming there are four households numbering 1, 2, 3 and 4 and the family size of these households are 5, 7, 6 and 4 respectively. The other status in different components guided by the HDR-2012 in measuring poverty for the village has been shown in Table-1. In table-1, the household deprivation score can be obtained sum of each deprivation multiplied by its weight. 1 indicates the deprivation in the indicator and 0 for non-deprivation.

- Weighted count of deprivation in household in above example is:
- Score of deprivation of household = $3 \times 5/3 + 5 \times 5/9 = 70/9$ which is equal to deprivation score of 78.1% showing a

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Table: 1

Measurement of Poverty Index

Indicators	Household				Weights
	1	2	3	4	
HH size	5	7	6	4	
Education					
None were completed 5 yrs of schooling	0	1	1	0	16.7% or 5/3
At least one schooling-age child not enrolled in school	0	1	0	1	16.7% or 5/3
Health					
At least one member is malnourished	0	0	0	0	16.7% or 5/3
One or more child have died	0	1	1	0	16.7% or 5/3
Living conditions					
No electricity	0	1	1	1	5.6% or 5/9
No access to clean to drinking water	1	1	0	0	5.6% or 5/9
No access to adequate sanitation	0	0	0	0	5.6% or 5/9
House has dirty floor	1	1	0	0	5.6% or 5/9
Household uses dirty cooking fuel	1	1	1	1	5.6% or 5/9
Household has no car and owns at most one of bicycle, motorcycle, radio, refrigerator, telephone or TV	0	1	0	0	5.6% or 5/9
Results					
	16.8%	78.1%	44.6%	27.9%	
Is the household poor (> 33.3 percent)?	No	Yes	Yes	No	

Source: HRD-2013

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- poor household. Similarly we can count the score of deprivation of the other households.

Head count ratio (H) will be obtained as:

$$H = \frac{7+6}{5+7+6+4} = \frac{13}{22} = 0.591$$

59.1 % of people live in poor households.

. Intensity of poverty can be computed as

$$\text{Intensity of Poverty (A)} = \frac{7 \times 0.781 + 6 \times 0.446}{7 + 6} = 0.626$$

The average poor person is deprived in 62.6 percent of the weighted indicator. Thus, the multi-dimensional poverty index (MPI) can be calculated as

$$MPI = H \times A = 0.591 \times 0.626 = 0.369 \text{ or } 37\%$$

The contribution deprived in different sectors which will be help for policy level. In this hypothetical example, these can be calculated as follows:

Contribution in deprivation in **Education sector**,

$$\text{contrib}_1 = \frac{\frac{16.7 \times 7 \times 2 + 16.7 \times 6 + 16.7 \times 4}{5+7+6+4}}{36.9} = 49.37\%$$

Contribution in deprivation in **Health sector**

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$$contrib_2 = \frac{16.7 \times 7 + 16.7 \times 6}{5 + 7 + 6 + 4} = 26.74 \%$$

Contribution in deprivation in **Living condition**

$$\begin{aligned} contrib_3 &= \frac{5.6 \times 3 \times 5 + 5.6 \times 5 \times 7 + 5.6 \times 2 \times 6 + 5.6 \times 2 \times 4}{5 + 7 + 6 + 4} \\ &= 48.29 \% \end{aligned}$$

On the basis of HDI values we can analyze its trend in Nepal.

Table-2

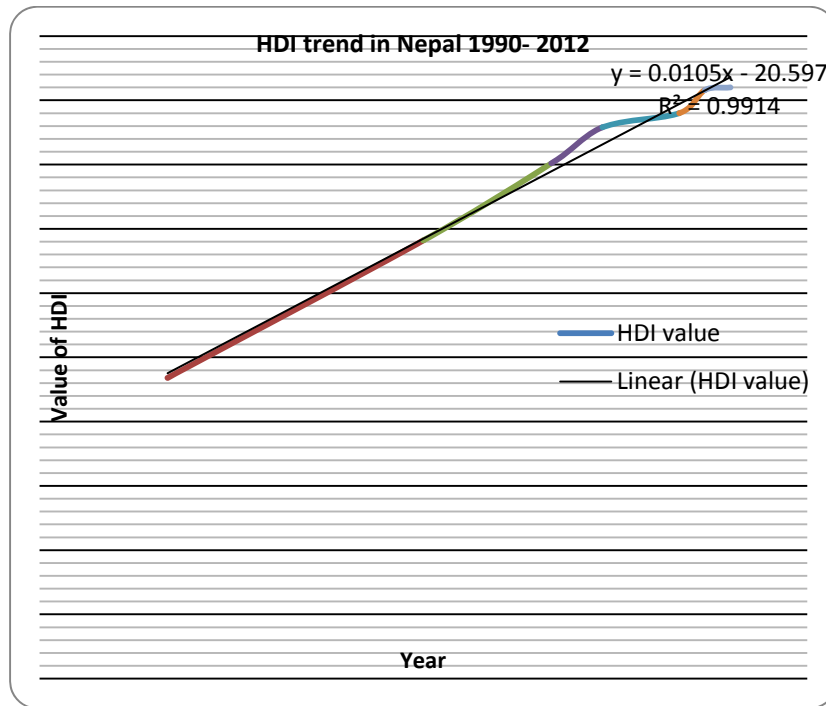
HDI value in Nepal (1990-2012)

Year	HDI value
1990	0.234
2000	0.341
2005	0.401
2007	0.429
2010	0.440
2011	0.458
2012	0.460

Source: UNDP, 2013

We have known that HDI values ranges from 0 (zero-minimum) to 1 (one –Maximum) representing lower condition to high level status as the value goes up of a society or a country. It shows the average value. In context of Nepal the minimum value in the time series is 0.234 and with the time series it is going increasing and in the year 2012 it reaches 0.46 i. e. , below half, still showing lower status.

Graph-1



Source: HDR, 2013

However in the graph-1, the trend values are almost linear. In each succeeding years the HDI values are increasing by same rate but the value of rate of increment is very small i. e., it is 0.0105. However, the response value ($r^2 = 0.991$) of the regression is very high showing best fit. The trend value of each year since 1990 to 2005 are almost shows constantly increasing

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2.5 Some Information from HRD

- Life expectancy at birth (years 2011)- 68.8
- Mean years of schooling (years 2011)-3.2
- Expected years of schooling (years2011)- 8.8
- Gross national income (GNI) per capita constant 2005 (ppp)- 1160
- Maternal mortality ratio- 380
- Adolescent fertility rate- 103.4
- Seats in national parliament (% female)-33.2

CHAPTER-THREE

Critique of the Human Development Index: A Review

3.1 Introduction

Human development index is a multi-dimensional aspect. During in the early phase of its development economic concept was highly dominated. With its pace other social, cultural, gender disparity etc., various concept related aspect had been raised. Over the time, a lot of improvement has been shown in computing of human development index up to now. However, critique has risen in different issues by various aspects in different time period. Here, it is going to explain briefly.

3.2 Conceptual issues

Conceptual foundations-income is not a functioning of longevity and knowledge but decent standard of living provides to other functions

Stock and flows-HDI is criticized for mixing stock variables (adult literacy and life expectancy) with flow variables (income per capita per annum and gross enrolment ratios) the combined effect is erratic (unpredictable) movements in the rankings on the release of new census data for the stock variables and unclear for comparison critic suggest for constructing Human Development Improvement Index from current flow which help to improve the HDI stock.

A single composite index- economic and social indicators should not be combined into a single figure into a single figure

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Silent on distribution-It is criticized that the HDI is silent on issues of distribution by gender, region, ethnicity, income and occupation. It is indeed a summary measure of average human development that is quite distinct from the distribution of human development.

3.3 Choice of dimension

A number of critics argue that new dimensions should be added to the index in order to increase its discriminatory power among countries and to make a more complete measure of human development.

A political freedom/Civil and political rights dimension- political freedom/Civil and political rights are an integral part of human development and many have objected to their absence from the HDI. Civil and political rights are subject ratings, such ratings may be expressed as number but they do not meet the criteria of reliability and validity, and so cannot be combined with real data.

An environmental dimension- environmental quality affects the living standards of the present generation and the prospects of the next. However, there are many problems of capturing environmental status in internationally comparable, valid and reliable data.

3.4 Choice of indicators

Given the existing dimensions of the HDI, some critiques focus on the validity, quality and comparability of the indicators.

Adult literacy-there is no universal definition of literacy, it has been criticized that a greater amount of linguistic knowledge is

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required across languages for the same level of literacy; it does not capture the quality of literacy.

Combined gross enrolment –The gross enrolment ratio is critiqued because it includes pupils outside the relevant age groups and repeaters who failed the previous year. It is recommended that, to reduce the over counting, the net combined enrolment ratios should be include.

Life expectancy or infant mortality – age specific mortality rates are not highly correlated with other. This is because life expectancy at birth takes account of infant mortality rates can change significantly while other age rates remain fairly stable. It is correlated with income. Age specific mortality rates are unavailable in many countries.

3.5 Data Measurement and Errors

Gross or Net domestic product

The gross domestic product is a flow measure and so does not take into account and should be count including the environment status. In the same time keep the account of the depletion of the natural base.

GDP discrepancies-GDP is incomplete and biased due to varying level of economic integration and the varying structures of economies, making international data ultimately incomparable. Even ppp is batter but it is calculated periodically.

Educational data quality- data of adult literacy and life expectancy are not updated annually by statistical agencies but use estimated values only.

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Are more indicators needed? The HDI has been criticized for being heavily concentrated on dimensions relevant to low levels of human development, making it limited in its range and application to high human development countries. There should be keeping two/three tiered index.

Comparison disparate data- in practice it is found that there is different in problems in comparison due to different definition, sampling Techniques, methodology, social and political environments, the motivations of the researchers.

Aggregation issues- in computation of HDI there are number of components which has used as aggregate form. Actually each component has different nature which cannot aggregate in a single unit.

Some other critiques have proposed alternatives fall into five main categories: poor data, incorrect choice of indicators, various problems with the HDI's formula in general, incorrect specification of income in particular, and redundancy. They are as follows:

Poor data

One category of critiques of the HDI addresses what some suggest is a poor quality of data, particularly in terms of the thoroughness of data collection and the frequency of measurement errors. Srinivasan (1994) and Ogwang (1994) point out that the census data used to calculate the HDI are unreliable because of the infrequency of census data collection, the possibility of inaccurate reporting, and a lack of complete coverage within countries. Srinivasan (1994) and Aturupane et al. (1994) each discuss a variety of concerns with measurement errors, including differing definitions – especially of literacy –

from country to country, and the absence of a measure of school quality or length of school year in the school enrollment index. The UNDP has strived to improve the HDR's data over the last two decade, although more improvement is, of course, still possible. HDR 1996 states that, "A major goal of the Report is to encourage national governments, international bodies and policy-makers to participate in improving statistical indicators of human development."

Wrong indicators

A second set of critiques concerns the selection of components included in the composite HDI. This critique takes two, closely related, forms: first that important indicators are missing from the HDI, and second, that those indicators included in the HDI are the wrong ones. The latter critique will be discussed below in the section regarding overall misspecification of the index. The former critique – that variables important to explaining human well-being have been left out – refers to indicators related to four main areas: the extent of civil and political liberties; distribution of income, access to health care, and access to educational opportunities; environmental impacts on well-being and access to natural resources; and further educational measures to include both stocks and flows.

While the UNDP has not added any new indices to the three original components, it has responded to the first three of these concerns by focusing an edition of the HDR on each topic: *HDR 1991* contains a Human Freedom Index; *HDR 1992* focuses on inequality and includes an Income-Inequality-Adjusted HDI; and *HDR 1998* addresses over-consumption and sustainability. The UNDP also responded to critiques regarding the HDI's original education index, which was based solely on adult literacy. This measure was changed, first by adding mean school years in *HDR 1991* to give a greater weight to current educational policies, and then by replacing mean school years

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with combined gross enrollment in *HDR 1995* because of difficulty obtaining data for mean school years for all countries.

Wrong specification

It has also been suggested that the formula used to calculate the HDI is arbitrary, unjustifiable, and incorrect. The HDI's components are combined using a simple, un-weighted mean – a method which has been likened to “adding apples and oranges.” Sager and Najam write that “the scheme of arithmetic averaging of the dimensions runs counter to the notion of their being essential and, therefore, non-substitutable.”

One key critique of the HDI's specification regards relative deprivation, or “moving goal posts.” From 1990 to 1993 the HDI had minimum and maximum values for all three components based on variable criteria, like the actual minimum and maximum in the current year, or an average threshold value, as with income. Calculating the component indices using minimum and maximum values that change each year both makes it difficult to compare between years and, as noted by Kelley “assumes that little or no progress in human development can be made by the developed countries.” In 1994, the UNDP began using fixed goal posts to calculate HDI: 25 and 85 years for life expectancy, 0 and 100 percent for adult literacy, 0 and 15 years for mean school years, and \$200 and \$40,000 for GDP per capita. When combined gross enrollment replaced mean school years in *HDR 1995*, it was assigned “goals posts” of 0 and 100 percent. Also in *HDR 1995*, the lower bound for GDP per capita was changed to \$100. These same fixed goals posts, as assigned in 1994 and updated in 1995, are still used today.

The second major critique leveled at the formulation of the HDI regards the equal weights assigned to the three components. Biswas and Caliendo (2001) call this weighting procedure “unsettling” and remark that “to the extent that one component index has a different variance than another equal

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weight seems unsatisfactory. Greater variability in one component index relative to represents information that is unused or ignored in simple averaging.” In *HDR 1991* (UNDP 1991), the UNDP justifies its weighting procedure by explaining that the three indices are equally important, and, “All three of the HDI components thus deserve equal weight.” Many critics have found this explanation lacking. Chowdhury says that it may be pointed out that there is an interesting paradox here. If a composite index is sensitive to weights, then one must be able to offer a solid defense of one’s chosen weights if the index is to be taken seriously. On the other hand, if the index is relatively robust, this would imply that the components are correlated, so that aggregation is pointless – any component would carry pretty much the same information. Streeten (1994), on the other hand, defends use of a simple average stating that it is a good tool for focusing on decreasing gaps between countries, and that there is a political appeal to a simple method. Some scholars have focused on the relative weight of income as compared to life expectancy and education.

Kelley says that it might be argued that the capacity to choose among many dimensions of human development accorded by expanded income in particular merits giving a relatively higher weight to this indicator. It is also important to note that the choice of the range of all three indicators affects the weight of the respective variable in the composite index. In order to avoid a bias resulting from the choice of endpoints, Panigrahi and Sivramkrishna (2002) suggest standardizing each indicator before combining them. The problem of implicit weights concealed by the explicit equal weights is discussed more fully in the section below on misspecification of the income indicator. Other possible weighting schemes include, according to Slottje (1991), establishing weights by: a social welfare function, a priori assumptions, regression coefficients, principal-components analysis (PCA), and the Borda method.

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The PCA method, which uses the variance of linear combinations of the components to determine potential weights, has been tested by several researchers. In the Borda method, ranks for the three components are added together and the sums are then re-ranked, with these new ranks becoming the composite index's values. Other methods not on Slottje's list include using a geometric mean (UNDP 1991); using statistics to calculate a composite index based on the standardized actual values and the standardized targeted values of the three components Mazumdar (2003); and multiplying the three indices, so that HDI will be more sensitive to low values in any one index (Sager and Najam 1998). In addition, Paul (1996) offers a Modified-HDI that raises each index to a given power before taking the arithmetic mean, so that the higher the power, the greater difference between countries' index values.

Noorkbakhsh (1998b) compares several different methods of arriving at a composite index using the HDI data, including the arithmetic mean, PCA, and Borda methods, and finds that the ranks for all methods are very similar, which provides a justification for the current HDI specification. Similarly, Biswas and Caliendo (2001) use the PCA method to arrive at nearly equal weights for the three components – Life Expectancy Index 34 percent, Education Index 34 percent; GDP Index 32 percent – and conclude that: Despite the simplistic methodology, it appears that the HDI is a good method of combining the component indexes and should be viewed, perhaps, with less skepticism...[L]ittle is lost in the simplistic method, and much is gained in terms of straightforwardness. Indeed, while the strength of the HDI appears to lie in its easy comprehension, the weights used therein are consistent with multivariate techniques that generate weights optimally. *HDR 1993* also reports the results of PCA studies and concludes that these support equal weighting. *Wrong measure of income per capita* The fourth type of critique is about specification of the income component of HDI. The original measure was the

shortfall of the base 10 logarithm of GDP compared to a maximum and minimum income value.

A further consideration is that the indicator should reflect the diminishing returns to transforming income into human capabilities. In other words, people do not need excessive financial resources to ensure a decent living. This aspect was taken into account by using the logarithm of real GDP per capita for the income indicator. More recently Haq also addressed the importance of adjusting income for diminishing returns: *The HDI* method thus emphasized sufficiency rather than satiety. It does not treat income as a means but reinterprets it in terms of the ends it serves. That is why, for example, the high income of the industrial countries is de-emphasized in the HDI and an overwhelming weight is given to the social progress they have achieved with this income.

Income is treated differently from the other variables because of the long-accepted practice in the field of economics of assuming that increases in income, and the goods and services that can be purchased with increased income, have a diminishing marginal effect on human well-being. Some critics of the HDI have raised the question of why life expectancy and literacy are not transformed to take their diminishing returns into account.

Noorbakhsh make this case in regards to the returns to literacy: It may be argued that the principle of diminishing returns also applies to educational attainments. To put it in a positive context, under similar conditions the early “units” of educational attainments to a country should be of much higher value than the last ones. In the context of policy-making in a country with 30% adult literacy, improvements in literacy are of far greater urgency than the same for a country with 90% adult literacy. On the other hand, it may be also argued that the value of the returns to increasing levels of educational attainment can be influenced in both directions, decreasing or increasing, by

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other factors such as the level of industrialization, capital accumulation and productivity.

Hicks and Streeten addressed these concerns noting that for other social indicators, “skewness at the upper end is more limited than it is for income per head...There is practically no limit to how much income a man can receive, but the maximum life span is limited.” They also point out that some social indicators, like life expectancy, capture the costs of both national affluence – for example, heart disease – and destitution. The original specification for income in the HDI was critiqued both on the grounds of its income cap, and for the use of logs, for example, by Rao “Since people do not compare ‘logs’ of incomes, it is better to simply use the absolute levels.”

The formula for HDI’s income component remained unchanged until 1994, when a new method of arriving at the Atkinson-formula thresholds was introduced, along with the explanation that: It was always questionable, however, whether the poverty level of industrial countries was an appropriate income target for developing countries. So, for the 1994 HDI, the threshold value has been taken to be the current average global value of real GDP per capita in PPP\$. Once a country gets beyond the world average, any further increases in per capita income are considered to make a sharply diminishing marginal contribution to human development. The HDI emphasizes sufficiency rather than satiety.

The Atkinson specification of income in the HDI was a popular target for critics, who condemned it for its discontinuity and recommended a more uniform transformation over the whole range of income. The rejection of a cap on the undiscounted income is explained by Sager and Najam in this way: The overall application of the GDP adjustment artificially depresses the relative affluence for wealthy nations so that the gap between the rich and poor countries seems much narrower than it actually is. The result is that the standard-of-living index

presents a falsely equitable picture of a world which in fact is more inequitable than ever...As long as it is below that threshold the focus is on ensuring survival and not on adding to human development.

Ravallion (1997) offers a deconstruction of the Atkinson method and critiques it in terms of its “implicit trade-offs,” that is, the terms under which countries can do well and poorly on differing indicators and end up with the same HDI score. He gives the example that \$99 was equal to one year of life for countries with GDP per capita below the income threshold; at two-times the threshold, this value was \$7,482; at three-times the threshold, \$31,631; and at four-times the threshold, \$65,038. Like Sager and Najam, Ravallion sees these trade-offs as having an ethical content:

In terms of both absolute dollar values and the rate of GDP growth needed to make up for lower Longevity, the construction of the HDI assumes that life is far less valuable in poor countries than in rich ones; indeed, it would be nearly impossible for a rich country to make up for even one year less of life on average through economic growth, but relatively easy for a poor country. *HDR 1993* includes a discussion of the problem of implicit weights in which the UNDP cautions against this sort of interpretation:

It would be tempting to interpret the relative coefficients as trade-offs, but a note of caution should be introduced. Superficially, it would be easy to say that one extra year of life expectancy is “worth” \$150 of income, but these are not choices open to an optimizing economic agent. Take a poor country with per capita income as high as \$1,500...An extra year of life expectancy (above a median value of about 50 years) would be the same as 10% growth in real per capita income. Neither of these two outcomes is likely in the short run, nor are they independent of each other in the real world. Thus, it would be wrong to interpret the coefficients as reflecting a “menu of policy choices.” In 1999, the UNDP switched to the current

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income specification in the HDI, with its continuous natural logarithm transformation and high cap of \$40,000. Lists three advantages of this new formula: the discounting is less severe; all levels of income are discounted uniformly; and middle-income countries receive recognition for increases in income that, under the Atkinson formula, would have been very heavily discounted.

3.6 Redundancy

The final category of critiques of HDI is redundancy. Various authors have suggested that the indicators in the HDI are highly correlated and that the HDI offers no new information beyond that readily available in GDP per capita. Kelley, for example, begins by agreeing with *HDR 1990* on the essential differences between HDI to GNP per capita which reproduces a graph of the HDI versus GDP per capita from *HDR 1990* updated with 2003 data from *HDR 2005*), but then plots HDI against log income per capita, which reproduces Kelley's graph with updated data, and concludes that, "The notable disparity between HDI and GNP/N, as highlighted in the *HDR*, vanishes. Indeed, log GNP/N appears to represent a reasonable approximation to the HDI." In presenting this critique, Kelley uses the same strange graphing technique employed by the UNDP explained about the different countries data in order of their HDI and GNP per capita values, using graph technique is central to Kelley's conclusion that HDI is redundant.

Still, in praising HDI, it is important to recall that its strength originates, at least in part, from not being a static measure, and instead being allowed to improve over time. Further revisions can continue to refine HDI in the future, to correct technical problems as they come to light, and to permit HDI to evolve towards the best possible measure of human capabilities and human development. As an example of a possible important revision to HDI it may be recalled that, while the UNDP's path-breaking work in bringing quantitative measures of human development to scholars, development

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professionals, policy-makers, and the general public has changed the field of international development for the better, its original vision of human development included distribution of capabilities across each nation. If the UNDP ignored distribution in the original operationalization of HDI, it did so only for a lack of data: “The case is strong for making distributional corrections in one form or another.” For some aspects of distribution – notably gender-based inequality and income inequality – these data now exist. For other aspects, the data have yet to be developed, but to the extent that demand drives supply in measurement tools, to let the absence of such data be an excuse for excluding measures of inequality would be unfortunate.

The existence of inequality in well-being can be addressed either by changes to HDI or by the addition of new inequality-related companion measures to the *HDRs*. These types of revisions have excellent potential as future steps in the continued improvement of human development measurement

The Human Development Index (HDI) is a well-known yardstick of wellbeing. Since its introduction twenty years ago, the index has attracted enormous interest in discussions of development, both in policy and academic circles as well as in the broader community interested in development issues.

The index emerged in the first Human Development Report (HDR), published in 1990. This was part of an intellectual effort led by the late Pakistani economist Mahbub ul Haq, together with a group of scholars that included Amartya Sen. It was born out of dissatisfaction with per capita income serving as the standard measure of development. Ul Haq says that any measure that values a gun several hundred times more than a bottle of milk is bound to raise serious questions about its relevance for human progress.

In many respects, the HDI has been remarkably successful. According to the New York Times, only one

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measure has succeeded in challenging the hegemony of growth-centric thinking... on Human Development Index. Its annual publication attracts significant attention from the media and national policymakers from a diversity of countries. Comparative data from internet searches shows that the HDR does far better than its main competitor in terms of Google searches. The HDR also seems to do better it is the first time that major changes have been simultaneously introduced to the indicators used to measure progress and the functional form used to convert them to a single measure of progress.

Until 2010, the HDI had been defined as a simple arithmetic average of normalized indices in the dimensions of health, education and income:

$$HDI = \frac{1}{3} \times (H_h + H_e + H_{ls})$$

Where H_i denotes the sub-index for dimension I, with $i=\{h,e,ls\}$ respectively denoting the health, education and living standards dimensions. Each of these indices were in turn estimated as normalized indicators of achievements in each of these dimensions. Life expectancy (le) and GDP per capita (gdp) were the proxies for health and living standards respectively, whereas the education dimension used two indicators: literacy (lit) and the gross enrolment ratio (ger). The indices were normalized using given upper and lower bounds. Thus:

$$H_h = \frac{Le - Le_{Min}}{Le_{Max} - Le_{Min}}$$

$$H_e = \frac{1}{3} \left(\frac{ger - ger_{Min}}{ger_{Max} - ger_{Min}} \right) + \frac{2}{3} \left(\frac{lit - lit_{Min}}{lit_{Max} - lit_{Min}} \right)$$

$$H_{ls} = (\ln(gdp) - \ln(gdp_{Min})) / (\ln(gdp_{Max}) - \ln(gdp_{Min}))$$

The reason for normalizing each dimension was to allow each of the sub-indices H_i to vary between zero and one, thus allowing the arithmetic sum of the indices to give equal relevance to each dimension. The criteria for choosing the upper and lower bounds changed over time: the 1990 report used observed minima and maxima but in 1994 this was changed to fixed thresholds. In the 2009 report, these limits were:

$$\begin{aligned} \{le_{Min}, le_{Max}\} &= \{25 \text{ years}, 85 \text{ years}\} \\ \{ger_{Min}, ger_{Max}\} &= \{0 \text{ percent}, 100 \text{ percent}\} \\ \{lit_{Min}, lit_{Max}\} &= \{0 \text{ percent}, 100 \text{ percent}\} \\ \{gdp_{Min}, gdp_{Max}\} &= \{100 \text{ US\$}, 40000 \text{ US\$}\} \end{aligned}$$

When a variable exceeded the upper bound of its dimensions, the value was truncated at the upper bound so that none of the dimension sub-indices H_i exceeded one. In practice, this only arose in the case of income per capita exceeding 40,000 US\$. But while the structure was the same as that introduced in 1990.

The human development approach is closely related to the idea of human capabilities proposed by Sen and developed further by, among others, Nussbaum and Robeyns (2005). In fact, the intellectual origins of both approaches are tightly intertwined. In 1989, as he was joining the team of collaborators that wrote the first HDR, Amartya Sen published the paper “Development as Capability Expansion,” in which he argued that “the foundational importance of human capabilities provides a firm basis for evaluating living standards and the quality of life.” The close collaboration between Sen, ul Haq and other members of the HDR team led to the idea of capturing these concepts in an aggregate index.

The idea of the HDI as an index of capabilities was clearly stated at the outset and in other writings by the report’s

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authors. The 1990 HDR, for example, describes the HDI as an index that captures the three essential components of human life...longevity and knowledge refer to the formation of human capabilities, and income is a proxy measure for the choices people have in putting their capabilities to use. Anand and Sen (2000) write that longevity and education are clearly valuable as aspects of the good life, and also valued as constituents of the capability to do other things...the income component of the HDI has been used as an indirect indicator of some capabilities not well reflected, directly or indirectly, in the measures of longevity and education.

The term capabilities refer to the opportunities that a person has to exercise his or her freedom to attain different kinds of alternative lives between which a person can choose. The HDI centers on three: living a long and healthy life, having access to knowledge, and a decent standard of living expand these freedoms.

But of course the HDI is a very imperfect measure of capabilities. As we detail below, it only captures some of the relevant dimensions and its choice of indicators is severely restricted by data availability. At the same time however, the concept of capabilities is so broad, rich and abstract, that any aggregate measure will necessarily entail a significant degree of generalization and approximation.

Unlike a social welfare function, a capabilities index does not carry the implication that one should seek to maximize it. Rather, a capabilities index is a summary description of the freedom that people have to pursue alternative valuable life plans. Expanding these freedoms should be one objective – and a very important one – of society. However, there is no

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contention that it should be the only objective, and there is the recognition that other objectives will enter into social decisions alongside the pursuit of human development.

For example, a relatively opulent society could decide to pursue actions that further expand the income of many of its citizens. For those of its citizens that are sufficiently well-off, the greater income may contribute to greater pleasure or enjoyment, but does not radically alter the lives they can lead. A society may find it worthwhile to pursue these actions, and the capability approach would not necessarily see this as objectionable. But these further improvements in income would not figure significantly into an index of capabilities, because the capabilities index is trying to capture the ways in which the choices open to people are qualitatively different. The HDI was part of an effort to shift attention away from an overly large focus on economic growth as the objective of development policies. In this sense, one of the main purposes of the HDI is to play an advocacy role, seeking to reestablish balance in priorities to counteract a focus distorted by a growth-centric approach. This motivation is evident throughout the 1990 report, starting with its statements in the opening paragraph that the report is about more than GNP growth, more than income and wealth and more than producing commodities and accumulating. Some critics, however, contend that the growth-centric approach that the HDR was designed to counter is merely a straw man. In an early review, T.N. Srinivasan wrote that income was never even the primary, let alone the sole, measure of development, not only in the minds of economists but, more importantly, among policy makers. It is true that much of development economics in the postwar era was about the structural transformation of economies and how this related to changes

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and improvements in multiple dimensions of well-being, including health and education, and that development practice up through the 1970s put significant emphasis on the promotion of national and global health initiatives.

This criticism of the HDI, however, misses the point that the human development approach was motivated more as an explicit challenge to the reigning paradigm of the late 1980s in development policy circles, commonly known as the Washington consensus. The “new” development economics was nowhere better symbolized than in the World Bank’s World Development Report’s practice of ranking countries by per capita income in the presentation of its tables. But it also found concrete expression in a literature which, using cross-national data sets to measure the effects of different determinants on economic growth, that would mushroom in the next decade; a literature that would in turn be closely associated with the policy recommendations of the Bretton Woods Institutions.

The 2000/01 World Development Report on Attacking Poverty was a turning point in the institution’s analysis, placing significant emphasis on non-income dimensions of well-being. This framework went beyond health and education, incorporating such topics as empowerment and security as important dimensions of wellbeing. A few years earlier, in 1998, the Bank had abandoned its practice of ranking countries by per capita income and shifted to an alphabetical presentation of its tables.

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Critiques of the choice of variables used in the HDI take two broad forms. First, the aspects of well-being included in the HDI obviously excludes other dimensions, such as equity, political freedoms, human rights, sustainability and happiness – just to name a few. Second, some specific indicators used to measure the core dimensions have been questioned.

Among critics of the narrowness of the HDI are Sagar and Najam (1998), who noted that the HDI ignores the environmental dimensions of development, especially the relationships between the performance of countries on the environmental and human development dimensions. This concern can be extended to other dimensions of capabilities, as the HDI is obviously not capturing all of people's freedoms and opportunities, but only a restricted subset. For example, Martha Nussbaum has defined a list of ten basic capabilities, such as being able to move about freely, to engage in various forms of social interaction, to participate effectively in political choices or to be protected against discrimination. Most of these capabilities are not measured in the HDI.

The criticisms leveled at the indicators used to measure the core dimensions are partly conceptual. A longstanding issue has been that the HDI is a mixture of stock and flow variables, as well as of inputs and outputs. For example, the gross enrolment ratio is a flow variable which is also an input into the educational process, whereas literacy measures a stock. However, the distinction between stocks and flows is not always clear. For example, life expectancy has been described both as a flow and as a stock variable. In fact, neither description is completely accurate: life expectancy is the expectation of a stock conditional on current flows, which

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responds directly to changes in these rates even though the intrinsic concept represented is a stock. It has also been noted that the reported indicators do not truly capture variations across countries in the relevant dimensions. Life expectancy is a measure of longevity but tells us nothing about the health of people during the time that they are alive and only captures part of the dimension of

The functional form of the HDI – described above – has attracted much attention, among other things because its simplicity leads one naturally to ask whether a more detailed consideration of welfare-theoretic issues would lead to a more complex form. Key concerns relate to the substitutability assumptions, the normalization of indicators, the asymmetric treatment of income, and the choice of weights.

The issue of substitutability has been raised by several authors, including Desai (1991), Palazzi and Lauri (1998), and Nathan et al. (2008). They saw the additive form of the HDI as problematic, because this implies perfect substitution across dimensions. There are constant marginal returns to improvements in each dimension, and therefore the marginal rate of substitution between dimensional achievements is also a constant. This would seem to run counter to the intuition that, the worse the deprivation in a particular dimension, the more urgent the efforts to improve achievements in that dimension should be regarded. For example, imagine that a country is suddenly affected by an epidemic that directly impacts on mortality and life expectancy, yet does not immediately reduce education or income.

The linear aggregation formula tells us that we should not give any more priority to investments in health, relative to those that improve education nor living standards, than we did before the HIV/AIDS crisis. It also leads to somewhat paradoxical results: if a society were to seek policies to

maximize its HDI, it may lead to corner solutions, where it would completely emphasize one dimension and disregard the others. Ravallion (1997), in contrast, argued that there is too much substitutability in the HDI. Note that while the HDI assumed perfect substitutability across dimensions, this is not the same thing as perfect substitutability across indicators. To understand the difference, note that in equation above the variable (gdp) is the indicator used to measure income, but this is distinct from the index HIs used to measure the living standards dimension. Because equation assumes that the dimension index used to measure living standards is concave in the indicator of income, the index will display imperfect substitutability between per capita income (an indicator) and the health and education indicators even if it displays perfect substitutability between dimensions.

One consequence of this fact is that the marginal rate of substitution of longevity for income i.e., the number of dollars that one would trade-off for an extra year of life if one were maximizing the HDI goes up with income. Ravallion argues that the rate at which the trade-off increases with income, is too high.

The arithmetic formula also means that results are sensitive to the choice of normalization. The problem emerges from the fact that the ordering produced by an additive functional form is not invariant to the scale used for measurement of the dimensions. The choice of normalization, which is in principle designed to keep the index on the 0-1 range, can thus have significant implications for the index values, and rankings. Different normalizations will imply different marginal effects of each variable's improvements on the HDI, with the choice of normalization implying a choice of implicit weights.

Since 1994, the HDI had used fixed upper and lower bounds. This led to the practice of "capping" i.e., truncating at

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the upper bound. By 2009, 12 countries (including Norway, Ireland and Kuwait) had their income capped at \$40,000 for the purposes of HDI calculation. This strong discontinuity in the index was justified in terms of the diminishing marginal effect of income on capabilities, although the latter was already incorporated in the logarithmic transformation. The idea that increases in average income beyond \$40,000 make no contribution. Finally, but not least, the choice of equal weights has been criticized. This point has been recognized by Anand and Sen (1997), who wrote that “any choice of weights should be open to questioning and debating in public discussions.” Ideally, the weights in the HDI should be traced either to individual preferences, some collective social choice process, or to a strong normative argument. One could, for example, derive these indicators from some type of empirical exercise, such as principal components analysis. Klasen, Nguefack and Zucchini Recent empirical investigations have confirmed that the HDI is actually quite robust to the choice of weights – which is good news, although this in turn could be taken to buttress concerns about potential redundancy. However, there are still very significant differences in country rankings between HDI and per capita income, and there are very different patterns in changes of time. So while the correlation between the levels of the HDI and their potential component is high, the index itself does provide important insights.

One could contend that such insights could just as easily be derived from separately analyzing disaggregated information on each of the component dimensions, and that summarizing all of this information in an aggregate number obscures important details, something unnecessary in a world in which the cost of conveying disaggregate information is low. But this ignores the communicational effectiveness of both the aggregate indicator

and the derived rankings in Recent empirical investigations have confirmed that the HDI is actually quite robust to the choice of weights – which is good news, although this in turn could be taken to buttress concerns about potential redundancy. However there are still very significant differences in country rankings between HDI and per capita income, and there are very different patterns in changes of time. So while the correlation between the levels of the HDI and its potential components is high, the index itself does provide important insights.

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Gender inequality remains a major barrier to human development. Girls and women have made major strides since 1990, but they have not yet gained gender equity. In this paper, we review ways to measure and monitor gender inequality, providing a critique of existing measures including the first global gender indices that were launched in the 1995 Human Development Report – the Gender-related Development Index and the Gender Empowerment Measure – and introduce a new index that is presented in the 2010 Human Development Report. The Gender Inequality Index, which addresses the key criticisms of previous measures, is unique in including critical issues of educational attainment, economic and political participation, and reproductive health issues and in accounting for overlapping inequalities at the national level. As such, it represents an important advance on existing global measures of gender equity. Measures of the disadvantages for women raise awareness of

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problems, permit monitoring of progress towards gender equity objectives and help keep governments accountable. In this light, the Gender Inequality Index is designed to reveal the extent to which the realization of a country's human development potential is curtailed by gender inequality, and provides empirical foundations for policy analysis and advocacy efforts. We also compare our results with the results of alternative gender inequality indices, finding significant variation in rankings across the various indices due largely to differences in the elements of gender inequality they seek to measure.

The Gender Inequality Index (GII) is unique in its focus on critical issues of educational attainment, economic and political participation, and reproductive health issues and in accounting for overlapping inequalities at the national level. As such, it represents an important advance on existing global measures of gender equity. The GII is designed to reveal the extent to which the realization of a country's human development potential is curtailed by gender inequality, and provides empirical foundations for policy analysis and advocacy efforts.

A number of composite measures of gender disparities are now available. The potential advantages of a composite index are that it provides a good summary of a complex multidimensional problem that is easily interpretable. This can help to understand the complexities of gender relations, and facilitate comparisons across time and countries. This in turn can attract public interest and capture the attention of policy makers. Single summary numbers also allow for national and subnational rankings, which are useful for advocacy purposes and to motivate government policy responses.

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The first global indices designed to reflect gender disparities were the Gender-related Development Index (GDI) and Gender Empowerment Measure (GEM) that were launched in the 1995 HDR. Since their introduction, the two measures have been used as advocacy and monitoring tools by UNDP and other developmental partners. In Korea for example the GEM has been used for lobbying purposes, which reportedly led to government actions to address the low representation of women in political and economic sectors.

The GEM was introduced as a complementary measure of gender equality in political, economic and decision making power. The three dimensions included are (i) control over economic resources, measured by men and women's earned income; (ii) economic participation and decision making, measured by women and men's share of administrative, professional, managerial, and technical positions; and (iii) political participation and decision making, measured by male and female shares of parliamentary seats. The measure usefully captures some aspects of female empowerment, although it has been criticised as having an unclear conceptual basis and questioned as to the appropriateness of the indicators.

The measures combine absolute achievements alongside relative aspects. This means, among other things, those countries with low absolute levels of income cannot approach gender equity, even if there is total parity in incomes.

a. The GDI is very strongly correlated with the level of GDP, while the gap in education and health indicators is not as well reflected. Because of this the GDI is also not clearly differentiated from the HDI. Similarly the GEM uses income levels (adjusted by gender gaps) rather than gender gaps in income. Because income levels tend to dominate the GEM, high income countries are generally on top of the classification, regardless of the extent to which women achieve equality in the included dimensions.

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b. The GDI is often misinterpreted as a measure of gender inequality – whereas it is actually a measure of how much (assuming a specific level of aversion to gender inequality) gender inequality reduces a given country's level of human development. While this shows the human development costs of gender inequalities in basic human development, it does not really measure the position of women as compared to men in society.

c. The indicators do not always correspond to the underlying concept. For example, “Legislators, Senior Officials and Managers” is used in the GEM to measure Economic Participation and Decision-making instead of political participation and decision-making.

Other issues have been raised around the selection of indicators. For example, the health component of the GDI – life expectancy at birth – raises issues of whether women's biological advantage in longevity should be considered as a gender gap, and whether the measure should consider the ‘potentially alive’ – in order to take into account ‘missing girls.’

e. Each of the indicators in the GEM arguably suffers from urban, elite bias. For example, the economic component is measured by female share of economic decision-making positions, which does not include agricultural or informal work (in which most women around the world labour), or work in the lower levels of the formal economy, nor does it measure the unpaid labour of care work. Therefore work-related aspects of empowerment are not measured for a broad part of the female population. Similar criticisms exist for other indicators in the GEM.

f. Over-reliance on imputations for missing data. In particular, for the estimated income shares, data is frequently unavailable and thus ultimately required imputations for over three quarters of the countries in the sample. Because the income component

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was the most important driver of the wedge between the HDI and the GDI, the overall measure was significantly weakened by these data shortcomings.

For example, Social Watch introduced a Gender Equity Index (GEI) which measures gender equity in education, participation in the economy, and empowerment. It has been published annually since 2004 – it was estimated for 104 countries in 2004 and expanded to 156 countries by 2009. Its key conceptual innovation was the inclusion of the dimensions presented separately in the GDI and GEM. The education dimension is measured by adult literacy rate and primary, secondary and tertiary level enrolments. The economic participation dimension uses two indicators—percentage of women in non-agricultural paid jobs and gaps in estimated female and male incomes (taken from HDRO estimates). And the empowerment dimension uses shares in professional and technical positions, administrative and managerial positions, as well as the share of parliamentary seats and ministerial positions held by women.

The World Economic Forum's Gender Gap Index (GGI), introduced in 2006, includes five dimensions of gender inequality – economic participation, economic opportunity, political empowerment, educational attainment and health and well-being. These are measured using 14 indicators-- the same indicators used in the GDI, GEM, and GEI, to which the sex ratio at birth is added. The GGI is calculated for 154 countries and is published annually. The index is calculated by converting data into male/female ratios, which are then truncated according to an “equality benchmark” and a somewhat elaborate weighting

Each of these gender indices makes valuable contributions to the understanding of gender disparities around

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the world. However, as described above, each suffers from inherent shortcomings in their empirical scope, methodology or execution. It is in this light that we have designed the new GII measure.

The Gender Inequality Index is designed to capture women's disadvantage in three dimensions—empowerment, economic activity and reproductive health - for as many countries as data of reasonable quality allow. The GII shows the loss in human development due to inequality between female and male achievements in these dimensions. It was designed taking as basis the association-sensitive welfare indices studied in Seth (2009). Specifically, the proposed Gender Inequality Index is based on the aggregation of achievements in society by using a general mean of general means of different orders—the first aggregation is by a geometric mean across dimensions; these means, calculated separately for women and men, are then aggregated using a harmonic mean across genders. This specific form of the index, as a harmonic mean (across genders) of geometric means (across indicators), was first proposed in Zambrano.

We carefully reviewed candidates for inclusion, bearing in mind some basic criteria for indicator selection (OECD, 2008):

- Conceptual relevance: strongly related to human development definitions and theory, so that the indicators measure what they are supposed to measure.
- Non-ambiguity: simple to interpret and monotonic such that higher (lower) values of the indicator suggest better (worse) outcomes in the respective dimension.
- Reliability: based on data that have been standardized in terms of definitions, statistical quality, and processing, ideally by a single reputable organization.
- Value added: each indicator should clearly add new information not captured by the remaining indicators (i.e. not

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redundant). Power of discrimination: the distribution of each indicator should differentiate well between countries, especially to avoid bunching amongst those at the top or bottom of the distribution.

Data availability and reliability remains a major constraint. In particular, while we have a better understanding of the importance of time use in thinking about well-being, and valuable data relating to this for some countries, this information is not generally available or regularly collected. The same is true of ownership of economic assets by women, despite its crucial importance. Another key dimension that is sadly both prevalent but not well documented is domestic violence. For participation in decision making, some community level indicators would be valuable, but nothing comparable is available. Likewise, a gender breakdown of electoral turnout is available for only a handful of countries. Hence it remains very difficult to capture the political, economic and social freedoms that are inherent in women's human development are from UNICEF's 2010 State of the World Children's Report, adolescent fertility rate data are from the 2008 revision of the World Population Prospects produced by United Nations' Department for Economic and Social Affairs (UNDESA), female and male shares of parliamentary seats are from the Interparliamentary Union's (IPU) database and labour force participation rates are from the International Labour Organization. Educational attainment at secondary or higher education levels come from Barro and Lee.

Two indicators are used to capture countries reproductive health situations. The maternal mortality ratio, which reflects the priority put on the well-being of women during childbirth, is a clear signal of women's status in the society. Current global estimates of maternal mortality – more than 500,000 women die each year because of complications related to childbirth – remain unacceptably high. The risk of death in childbirth, appallingly high in many countries around the world, could be reduced through the provision of basic

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education, access to contraceptives, the provision of antenatal health services, and skilled attendance of births. But such services are denied to too many women in the 21st century. Many interventions that can decrease maternal mortality, such as providing women in childbirth with a trained birth attendant, are inexpensive. Some interventions, such as bans on female genital mutilation and discouraging teenage fertility and other harmful traditional practices, are less about spending and more about leadership in changing social norms.

The other indicator utilized is the adolescent fertility rate for 15-19 year olds. This indicator highlights that reproduction is not only risky, it often begins too early. Many girls have children at such a young age that their health is compromised and future opportunities are limited. For example, research in Mexico among poor women suggests that early childbearing is associated with poor living conditions, lower monthly earnings, and decreased child nutrition. Bearing a child while very young may reflect a lack of meaningful options outside of taking on the role of mother. Premature pregnancy and motherhood pose considerable health, economic, and social risks to teenage girls. Early childbearing tends to prevent them from achieving a higher level of education, and often destines them to low-skilled jobs at best. The younger a girl is when she becomes pregnant, the greater the health risks for herself and her baby. Maternal deaths related to pregnancy and childbirth are an important cause of mortality for girls aged 15–19 worldwide, accounting for nearly 70,000 deaths each year. The risk of death during child birth is five times higher in teenage births, in part because their bodies are not yet fully developed. Education, especially higher levels of attainment, brings empowerment because it strengthens people's capacity to question, reflect and act on one's condition and increases access to the information needed to do so. Educated women are more likely to enjoy satisfying work, to use their voices in public debate, to be able to care for their own health and that of their family, and to take other

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initiatives. In this light education is particularly important in strengthening the agency of women. Women's education also has instrumental importance for economic growth and children's health by fostering the capacity to absorb new information on health, nutrition, and hygiene and to stimulate and facilitate children's learning. For example, a study in rural Zimbabwe revealed that education and paid work positively affected the likelihood that a woman will access contraception and antenatal care.

Our second indicator is the share of female and male seats in parliament. Women have traditionally been disadvantaged throughout the world in the political arena, at all levels of government. Unfortunately the measures available in this area are sparse. Estimates for parliamentary representation at the national level reflect women's visibility in political leadership and society more generally, and the extent to which women can hold high offices. While this measure has the broadest country coverage, it excludes political participation at the community and local levels.

There are other crucial elements of empowerment, but internationally comparable measures do not exist. For example, violence against women, both inside and outside the home, is an important and revealing issue, but it is not internationally measured with consistency and comparability. General insecurity - including strife - can also pose particular risks to women's physical safety as well as their participation in society, but here too we do not have the data.

In measuring economic activity, we decided to rely on female and male labour force participation rates. While some women choose not to participate in the formal labour market, or drop out to attend to unpaid family care responsibilities (care of children and/or elderly family members), relative labour force

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participation can be taken to reflect the degree of economic activity of women versus men. However, we know that much of women's work, especially in the home and in family businesses, is unpaid, and that women's informal work is undercounted, thus labour force participation does not accurately reflect women's work efforts. Further, it is well known that there are significant barriers to women's full participation in the economy. We also know, for example, that the gender wage gap persists at around 17 percent in OECD countries – ranging from 38 percent in South Korea to 9 percent in Belgium. Sex segregation in the workforce remains a daunting barrier to equality. For example, women's representation in occupations that have decision-making responsibilities—managers and analysts—falls well below that of men's. Women are Labour force participation, as traditionally measured, ignore the important contributions of women in unpaid work and may perpetuate the undervaluing of these critical activities. Yet, unfortunately data are too scarce to remedy these issues. Data on earned incomes and consumption are especially weak at the global level. Per capita consumption data, when available, do not account for inequalities in intrahousehold distribution of resources. The unemployment rate was considered but was ultimately dismissed due to the fact that this is not well-measured and, in poor countries, is largely an urban phenomenon. Few rural women tended to be counted among the unemployed and the urban informal sector also tends to be excluded. Finally we do recognise that some of the indicators will not have much inter-temporal variation, in part due to infrequent measurement. In particular this is the case for the education indicators and maternal mortality ratio.

The maternal mortality ratio is truncated symmetrically at 10 (minimum) and at 1,000 (maximum). This is partly a normative judgment that conditions in countries at each extreme of the distribution are effectively very similar, but also due to a practical concern about the accuracy and precision of these rates.

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It is true that reproductive health indicators used in the Gender Inequality Index do not have equivalent indicators for males. So in this dimension, the reproductive health of girls and women is compared to assumed norms of no maternal death, and no adolescent pregnancy.

□ The female parliamentary representation of countries reporting 0% is coded as 0.1% because it seems reasonable to assume that there is some very minimal level of political influence of women in all countries.

The critique suggested that to compute GII we should use the following formula.

$$\begin{aligned}
 & \text{GII} = 1 - \\
 & \frac{\left[\left(\sqrt[3]{\left(\frac{1}{MMR} \times \frac{1}{AFR} \right)^{\frac{1}{2}} (PR_f SE_f)^{\frac{1}{2}} LFPR_f} \right)^{-1} + \left(\sqrt[3]{(PR_m SE_m)^{\frac{1}{2}} LFPR_m^{-1}} \right)^{-1} \right]}{\sqrt[3]{\left(\sqrt{\frac{1}{MMR} \times \frac{1}{AFR}} + 1 \right) (\sqrt{PR_f SE_f} + \sqrt{PR_m SE_m}) (LFPR_f + LFPR_m)}}
 \end{aligned}$$

Actually HDI is not sufficient to evaluate the proper situation of a country. To improve the holistic condition of Less Development Countries (LDC) approach for graduation is equally relevance for HDI. Therefore, a short description about LDC approach for graduation will be introduction in the portion of the chapter.

3.7 LDC Graduation Criteria and Evolution

The United Nations Committee for Development Policy (UN-CDP) defines least developed countries as countries with low income and affected by low social and economic structure, which constitute obstacles for the development of those countries. Three dimensions have been identified to classify a country as LDC: 1) income, using Gross National Income (GNI) per capita as a measurement; 2) human asset dimension,

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measured by the Human Asset Index (HAI), which is based on two sub-dimensions - health and education; and 3) economic vulnerability dimension measured by Economic Vulnerability Index (EVI), which is based on two sub-dimensions - exposure and structural vulnerability. These three dimensions have been translated into three criteria for determination of LDC including GNI per capita, HAI and EVI.

CDP uses GNI per capita, HAI and EVI as the main indicators to classify a country as LDC. The threshold of each criterion is determined by CDP based on triennial reviews as the average of the world socio-economic indicators changes over time.

- GNI per capita: This criterion is based on the World Bank (WB) classification of low income country, so that the GNI per capita threshold of LDC inclusion is the threshold for low income country classification of the WB. Based on 2012 reviews, current GNI per capita threshold for LDC inclusion is USD 992.

HAI: it is an index indicating level of human capital development of a country. HAI is an index of four indicators of health and education dimensions. There are two indicators of health sector including indicator of undernourishment and child mortality rate. Education sector indicators included are school enrolment and adult literacy. The four indicators are equally weighted as shown in chart 1. Based on the CDP triennial review in 2012, the current HAI threshold is 60.

EVI: it is a composite index to measure vulnerability structural characteristics of a country that would make it prone to be affected by shocks (resilience). In this regard, EVI does not take into account vulnerabilities that result from economic policy choices made in the recent past and which are of a conjectural

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nature (UN DESA, 2012). EVI is an equally weighted composite index of two indices, exposure index and shock index.

+ Exposure index indicates exogenous structures of a country, which composes of four sub-indices including size measured by indicators of population; location measured by remoteness; economic structure measured by merchandise export concentration and share of agriculture, forestry and fisheries; and environment measured by share of population in low elevated coastal zones.

+ Shock index is a composite index of two sub-indices including trade shock measured by indicators of instability of exports of goods and services; and natural shock measured by victims of natural disasters and instability of agricultural production (Graph 2). Based on triennial review of CDP in 2012, current EVI threshold is 36. Population size is both a component of the EVI and a condition that determines whether a Country should be eligible for least developed status. In 1991, the CDP ruled that countries with a population exceeding 75 million should not be considered for inclusion in the list of least developed countries. The population cut-off does not apply to countries that were on the list when the parameter was introduced. Additionally, population size is not a criterion for graduation (UN DESA, 2012).

LDC Inclusion Process

CDP conducts triennial reviews and determines threshold for LDC criteria and list out all countries eligible to be included in the list of LDC. After that the UN Department of Economic and Social Affairs - UN DESA make a report to government of related countries that has been recommended to be included in the list of LDC with the social and economic evaluation report attached. Related governments may issue an acceptance letter without any objection and CDP reports to Economic and Social Council (ECOSOC) to be approved in the UN General Assembly at later stage. However, if receiving any objection

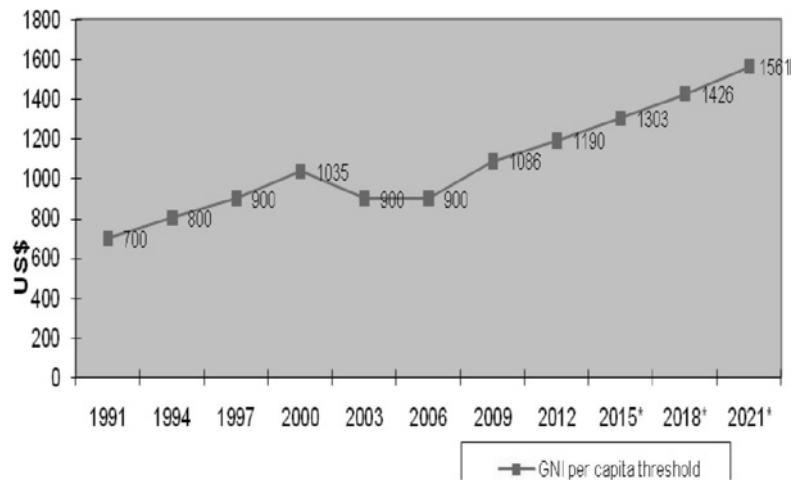
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letter from related government regarding the assessment, UN DESA takes note and would not include that country into LDC list to report to ECOSOC LDC Graduation Criteria CDP is also responsible for review and recommend eligible countries to be graduated from LDC status. The criteria for LDC graduation are also based on those three LDC criteria, GNI per capita, HAI, and EVI.

GNI per capita criteria

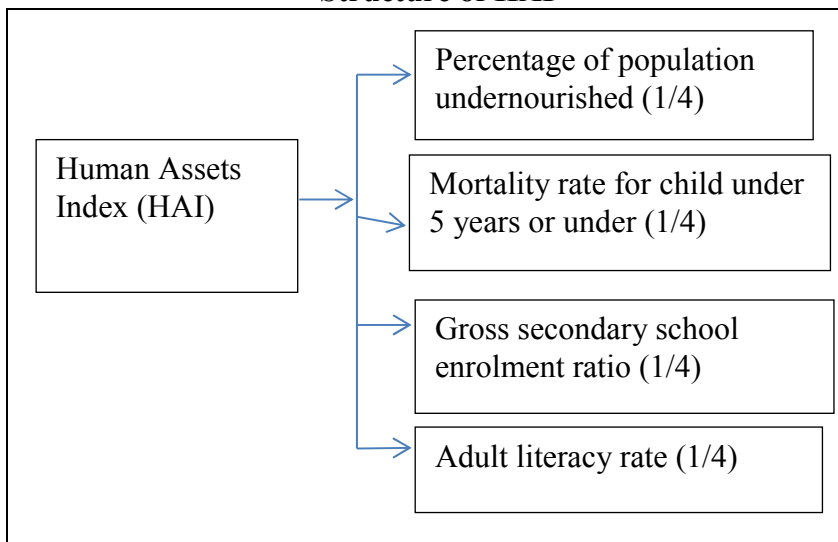
Similarly as the LDC inclusion criteria, CDP uses WB classification of low income country threshold, where the graduation threshold is 20% higher than the inclusion threshold. Based on the 2012 review, the graduation threshold of GNI per capita criteria is USD 1,190. Graph 2, shows the change of GNI per capita threshold in 20 years from about US\$ 700 in 1991 to US\$ 1,190 in 2012. Looking at the trend of the increase of the threshold which is about 2-3% increase over time, by using atlas method we may estimate the possible threshold in near future as shown in Graph 2.

Graph-2



Source: CDP, UNCTAD

Box-5
HAI criteria
Structure of HAI



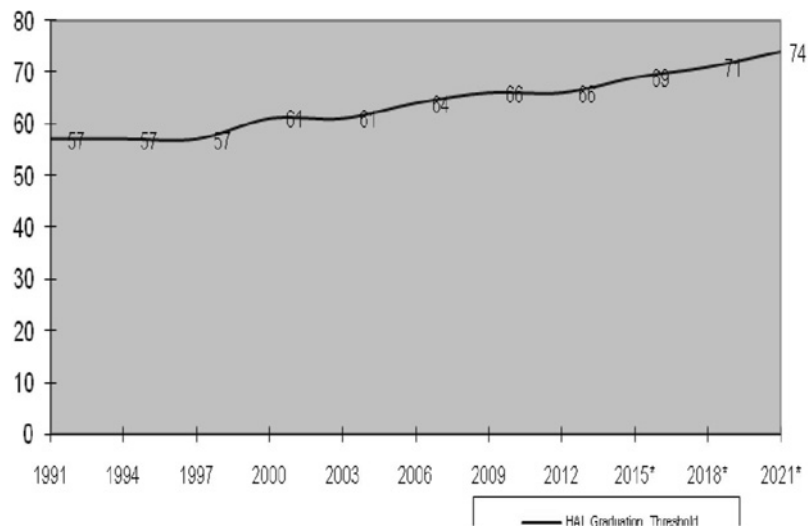
Source: CDP

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From 1991, the HAI threshold for LDC graduation increased from 57 to 66 in 2012, with an average increase of about 0.5-0.6% per year (Figure 8). Based on the estimation of UNCTAD as well as the actual change of the threshold over the past twenty years and by previous estimate of scholars, the future thresholds of HAI might be estimated as shown in Figure 8. Indicators used for HAI calculation are changing over time based on recommendation from CDP. Previously, there was only adult literacy rate indicators used for educational dimension to calculate this index, but since 1990, the health dimension was integrated into this index in order to measure human capital development. Graph 3 shows the changes of dimension and indicators for calculating HAI over time.

Trend of HAI (1991-2012)

Graph-3



Source: UNDP, UNCTAD

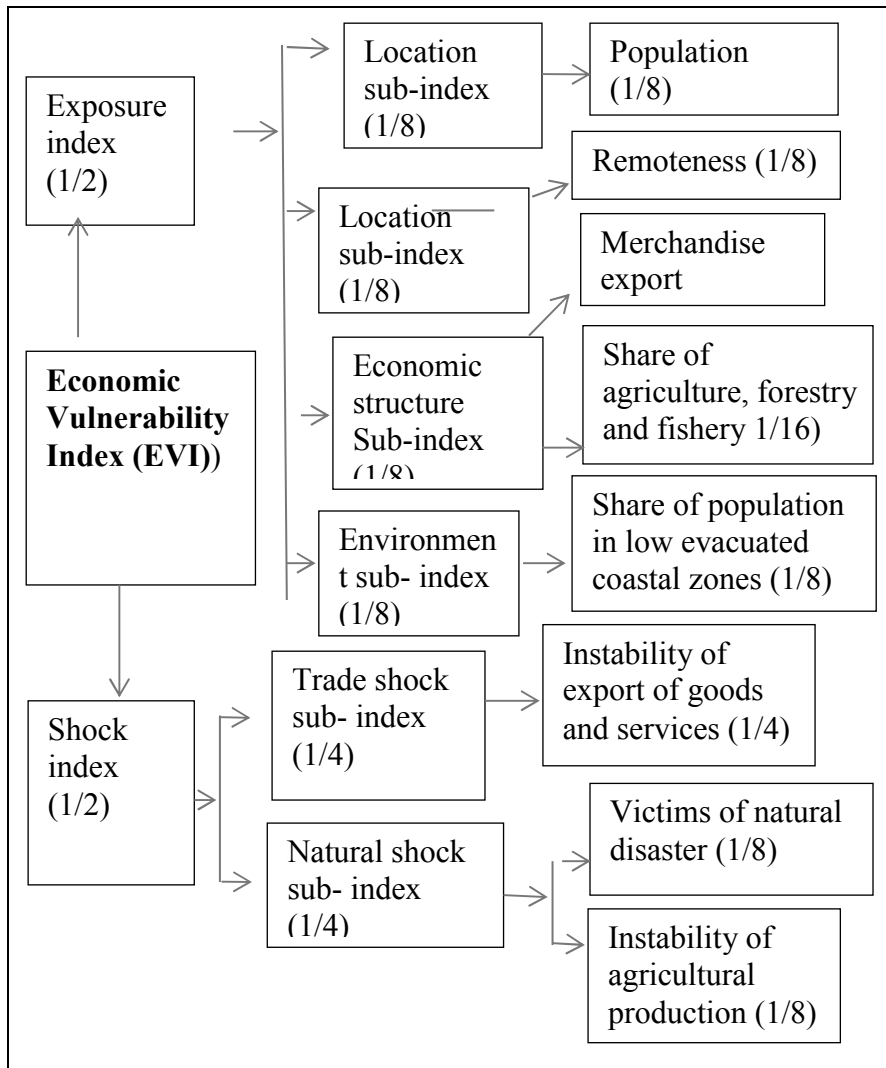
EVI Criteria

Economic vulnerability index is a significant evaluation step of CDP expert group as this assessment shows social and economic stability status of a country. The threshold of EVI as the latest reviews of 2012 is 33. The criteria have also been revised from time to time and it is frequently compared to other criteria. During 1991- 1997, the criteria used Economic Diversification Index (EDI) to measure the third criterion of LDC graduation.

However, since 2000 this criterion has been measured by EVI instead. Graph3 shows the change of EVI in previous reviews. The composition of indicators to calculate EVI has also changed over time. In 1992, the EVI was calculated based on two dimensions of economic structure and shocks, which was calculated using five indicators. In 2005, two more indicators had been included and since 2011 one more indicator was added resulting in the current eight indicators used for calculating EVI. Chart shows the change of EVI dimension and indicators from time to time. This criterion has changed its indicators substantially and it is possible that it continue changing in the future. Therefore, estimation of its future threshold might be difficult to do.

Box-6

EVI Structure and Indicators

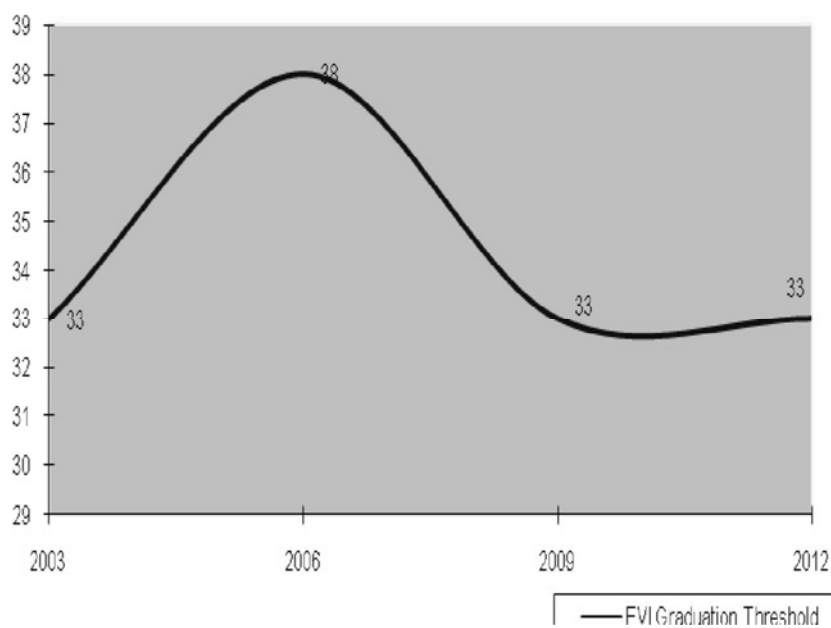


Source: CDP

Note: Based on earlier estimation of Debapriya Bhattachanrya (2009), with the increasing trend of 4.5% per year of HAI, the HAI graduation threshold for 2012, 2015, 2018 and 2021 might be 69, 71, 74 and 77 respectively. However, due to the previous triennial review in 2012, HAI stayed at the same score of 66. We estimate the increase of HAI with the same score in near future and starting from 69 for next review and so on.

Graph-4

Trend of EVI value



Source: UN-CDP

CHAPTER-FOUR

Political freedom and gender inequality in Human Development Index

4.1 Introduction

Socio-economic, cultural, political condition, of a country shows the empowerment situation of male or female. Due to peculiar physical feature of female than male it has been shown by their reproductive health in particular country. Reproductive health is an extremely relevant dimension to evaluate individuals 'well-being levels that has been completely absent in other well-known UNDP composite indices, like the Human Development Index (HDI), the Human Poverty Index.

Gender inequality remains a major barrier to human development. Girls and women have made major strides since 1990, but they have not yet gained gender equity. We will review ways to measure and monitor gender inequality, providing a critique of existing measures including the first global gender indices that were launched in the 1995 Human Development Report – the Gender-related Development Index and the Gender Empowerment Measure – and introduce a new index that is presented in the 2010 Human Development Report. The Gender Inequality Index, which addresses the key criticisms of previous measures, is unique in including critical issues of educational attainment, economic and political participation, and reproductive health issues and in accounting for overlapping inequalities at the national level. As such, it represents an important advance on existing global measures of gender equity. Measures of the disadvantages for women raise awareness of problems, permit monitoring of progress towards gender equity objectives and help keep governments accountable. In this light, the Gender Inequality Index is designed to reveal the extent to

which the realization of a country's human development potential is curtailed by gender inequality, and provides empirical foundations for policy analysis and advocacy efforts. We also compare our results with the results of alternative gender inequality indices, finding significant variation in rankings across the various indices due largely to differences in the elements of gender inequality they seek to measure.

The GEM was introduced as a complementary measure of gender equality in political, economic and decision making power. The three dimensions included are (i) control over economic resources, measured by men and women's earned income; (ii) economic participation and decision making, measured by women and men's share of administrative, professional, managerial, and technical positions; and (iii) political participation and decision making, measured by male and female shares of parliamentary seats. The measure usefully captures some aspects of female empowerment, although it has been criticized as having an unclear conceptual basis and questioned as to the appropriateness of the indicators. These measures have also been criticized for their conceptual and methodological limitations and they have been frequently misinterpreted.

4.2 Criteria for Measuring Index

HPI, the GDI and the GEM to capture countries' reproductive health situations, two indicators have been used: the maternal mortality ratio (MMR) and the adolescent fertility rate (AFR). The maternal mortality ratio, which is denoted as the number of maternal deaths per 100000 live births, captures a leading cause of death and disability among women of reproductive age in developing countries. The adolescent fertility rate is denoted as the number of births per 1000 women aged 15-19, so it represents the risk of childbearing among adolescent women. This is an important indicator because women that have children

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at such young ages see their health and future opportunities in life compromised Empowerment. The notion of women's empowerment gained momentum since the International Population Conference held in Cairo in 1994 and has been gradually incorporated in national and international institutions everyday parlance.

Under empowerment dimension the indicators chosen for the GII are educational attainment i.e., at least secondary level education (SE) and parliamentary representation (PR). Education is essential factors that contribute to the creation of knowledge and self-condense. It is widely acknowledged; both on theoretical and empirical grounds, that literacy-related skill are a necessary condition to escape out of poverty. Education brings empowerment because it strengthens people's capacity to question and act on one's condition and increases accessibility to the information needed to do so. On the other hand, PR is a crude but widely available measure of women's access to the levers of power.

When measuring economic activity, the GII uses the gender specific labour force participation rates (LFPR). This is an important variable that replaces the problematic gender-specific earned income component that was used both in the GDI and GEM. The measurement of the LFPR is much more reliable, even though it is not devoid of certain problems. As mentioned in Gaye et al Labour force participation, as traditionally measured, ignores the important contributions of women in unpaid work and may perpetuate the undervaluing of these critical activities. Therefore, much work still needs to be done on the appropriate measurement tools to capture the informal and care economy sectors in which women are typically overrepresented.

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The determinants of cross-national variation in the share of parliamentary seats held by women are a very important for a development country. If we observed the findings of prior research on this issue have differed sharply. Studies focusing on the most affluent longstanding democracies have emphasized the importance of political factors, whereas three of the four studies to include less developed nations found that only socioeconomic and/or cultural factors matter. Our analysis uses improved variable measures, a more complete set of variables, and a larger sample of countries than has heretofore been examined. We find that political, socioeconomic, and cultural factors are each important. Specifically, electoral system structure, left party government, the timing of women's suffrage, the share of women in professional occupations, and cultural attitudes toward the role of women in politics each play a role in accounting for variation in the degree of gender inequality in political representation around the world.

We can summarize some of the important efforts that have done to reduce gender gap in society/country at national or international level which are as follows:

- GDI (gender-related development index) measures the inequality status between men and women in any society/country.
- GEM (gender empowerment measure) indicates whether women are able to actively participate in economic and political life in decision making or not.
- These two measures (GDI and GEM) show gender status involvement in economic development.

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- GDI incorporates the degree of gender inequality aversion of the concern society which reflects the social choices.
- Both (GDI and GEM) are the advocacy tools of civil society movement.
- Both (GDI and GEM) measures are extremely relevant to policies and programmes.

The various policies and measures have been practices to reduce gender inequality at national and international level. However, there are some drawbacks which can be summarized as follows:

- a. The measures combine absolute achievements alongside relative aspects. This means, among other things, those countries with low absolute levels of income cannot approach gender equity, even if there is total parity in incomes. The GDI is very strongly correlated with the level of GDP, while the gap in education and health indicators is not as well reflected. Because of this the GDI is also not clearly differentiated from the HDI. Similarly the GEM uses income levels (adjusted by gender gaps) rather than gender gaps in income. Because income levels tend to dominate the GEM, high income countries are generally on top of the classification, regardless of the extent to which women achieve equally in the included dimensions.
- b. The GDI is often misinterpreted as a measure of gender inequality – whereas it is actually a measure of how much (assuming a specific level of aversion to gender inequality) gender inequality reduces a given country's level of human development. While this shows the human development costs of gender inequalities in basic human development, it does not really measure the position of women as compared to men in society.

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c. The indicators do not always correspond to the underlying concept. For example, “Legislators, Senior Officials and Managers” is used in the GEM to measure *Economic Participation and Decision-making* instead of political participation and decision-making. Other issues have been raised around the selection of indicators. For example, the health component of the GDI – life expectancy at birth – raises issues of whether women’s biological advantage in longevity should be considered as a gender gap, and whether the measure should consider the ‘potentially alive’ – in order to take into account ‘missing girls.

e. Each of the indicators in the GEM arguably suffers from urban, elite bias. For example, the economic component is measured by female share of economic decision-making positions, which does not include agricultural or informal work (in which most women around the world labour), or work in the lower levels of the formal economy, nor does it measure the unpaid labour of care work. Therefore work-related aspects of empowerment are not measured for a broad part of the female population. Similar criticisms exist for other indicators in the GEM.

f. Over-reliance on imputations for missing data. In particular, for the estimated income shares, data is frequently unavailable and thus ultimately required imputations for over three quarters of the countries in the sample. Because the income component was the most important driver of the wedge between the HDI and the GDI, the overall measure was significantly weakened by these data shortcomings.

CHAPTER-FIVE

Using the HDI for policy analysis

5.1 Introduction

Basic principles of HDI are as follows:

- Measure the basic purpose of human development-people's choice
- Include a limited number of variables to keep its simple and manageable
- Be composite rather than a plethora (surplus) of separate indices.
- Cover both economic and social choices.
- Be sufficiently flexible in both coverage and methodology.
- It has not be inhibited by lack of reliable and up-to-date data series.

From the help of HDI, the following are the major achievements in policy decisions in significant ways:

* Income is means but not ends

a) Policies for human well-being by the resource allocation in institution building

b) After 90's at least 20% of domestic revenue should be expend on human development priorities

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c) Various macroeconomic policies have been changed toward human well-being in developing countries, expenditure on HIV/AIDS, etc. after 90's.

* Became more useful to compare development strategies between countries toward basic human concerns and became as a means of guideline to overcome the shortcomings for development strategies.

* Looking the status of HDI in state or region or district or municipality or rural level, NGOs and institutions of civil society in different levels have used it to highlight their various issues including international and global events.

* The HDI leads to various exercises for monitoring and evaluation and became the indicators of government activities toward human development prospective. It leads to mobilization of new and more systematic information in national and international level.

* With the help of HDI, the serious academic research and empirical studies on the issues of theoretical refinement have become possible. Its Consistency, statistical properties, robustness, increase in predictive power and also suggest the various refinements have become possible.

However there are some weakness to include all aspect of human development through HDI, among them major weaknesses are as follows:

* It is not a perfect index to capture the whole aspect of human development. Any aspect cannot capture by its measurement i. e., fully reflect the concept

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* HDI includes only three aspects related to human development they are: a long and healthy life, knowledge and a decent standard of living but it excludes those activities of human being which are equally importance they are: participation in social activities, political freedom, human security, etc.

* HDI does not provide a comprehensive picture of the society in any situation of human development.

References

- Alkire, S., and J. Foster. 2010. "Designing the Inequality-Adjusted Human Development Index (HDI)." Human Development Research Paper 28. UNDP-HDRO, New York.
- Alkire, S., and M. Santos. 2010. "Acute Multidimensional Poverty: A New Index for Developing Countries." Human Development Research Paper 11. UNDP-HDRO, New York.
- Amie Gaye, Jeni Klugman, Milorad Kovacevic, Sarah Twigg and Eduardo Zambrano. 2010. Measuring Key Disparities in Human Development: The gender Inequality Index –HD Research paper No. 46 paper, UNDP.
- Anand, S., and A. Sen. 1992. "Human Development Index: Methodology and Measurement." Background paper for *Human Development Report 1993*. UNDP-HDRO, New York.
- . 1995. "Gender Inequality in Human Development: Theories and Measurement." Human Development Report Office Occasional Paper 19. UNDP-HDRO, New
- . 1997. "Concepts of Human Development and Poverty: A Multidimensional Perspective." in *Human Development Papers 1997: Poverty and Human Development: 1 – 19*. UNDP-HDRO, New York.
- Debapriya, B.2009. " Bangladesh's Graduation from LDC Status – Timeline and Policy Implication." UNCTAD, United Nations..
- Jahan, Selim 2000. "Measurements of Human Development : Seven Questions". Presentation at the First Human Development Course at Oxford University. U.K. September.

96 *Assessment of Human Development Index*

- 2001. “Indicators at Work around the World : The Human Development Index”. Keynote Speech at the National Conference on Sustainable Development Indicators, organized by the Round Table on the Environment and the Economy (NRTEE) in Ottawa, Canada, 27 March, 2001.
- .2002. “Measuring Human Development: Evolution of the Human Development Index” UNDP Retrieved from Johan- HDI-pdf
- 1999a. “Gender Equality Indices in the Human Development Reports : Concepts, Measurements and Impacts” in Stone Leroy and others (eds.) Gender Equality Indicators : Public Concerns and Public Policies. Statistics Canada. Ottawa. January.
- 1999b. “Measurement of Human Development : Evolution of Indices and Indicators”. Paper Presented at the First Global Forum on Human Development. New York. July.
- Kovacevic, M. 2010. “Review of HDI Critiques and Potential Improvements.” Human Development Research Paper 33. UNDP–HDRO, New York.
- NERI.2012. “Enhancing Lao PDR’s Development toward Achieving 2020 vision” Lao, Research Network Conference.
- Oraboune, S. 2013. “Lao PDR’s Development LDC Graduation by 2020” National Research Institute, Lao PDR.
- Shiva Kumar A.K. , and Fukunda P.S. 2003. “Critiques of the human development index: A reviews.” New Delhi, Oxford University Press.

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- United Nations Conference on Trade and Development (UNCTAD) (2009), *the Least Developed Countries Report 2009 – The State and Development Governance*, United Nations, 2010
- (2010), *The Least Developed Countries Report 2010 – Toward A New International Development Architecture for LDCs*, United Nations, 2010
- World Bank .2013. “World Development Indicators-2013.” The World Bank Group.

