Chapter II

The Origin and Development of UNDP's Human Development Index

2.1: Genesis of Human Development Index (HDI)

In 1990 the United Nations Development Programme (UNDP) brought out its the first Human Development Report (HDR) prepared by a distinguished team of economists under the direction of Mehbub Ul Haq. The first HDR (1990), introducing the concept of human development, argued that the real purpose of development should be to enlarge the choices of the people. The central message of the HDR (1990) was that while growth of GDP was absolutely necessary to meet all essential human objective, what was important was to study how this growth translated or failed to translate into human development of various countries. To quantify and clarify the process of human development, the HDR introduced a new yardstick of human progress, namely the Human Development Index (HDI).

The HDR (1990) argued that a basic distinction needed to be made between the means and ends of development. Human beings are the real end of all the activities. Hence development must be centered on enhancing their achievements, freedom and capabilities. It is the lives they lead that is of intrinsic importance, not the commodities or income they happen to posses. Accordingly either income or wealth or commodities do have instrumental importance but they do not generate a direct measure of well being or living standard. It is not possible through income to account for individual differences in morbidity, mortality or disability. However, these features seem to deserve priority in any assessment of living standard (Anand and Sen, 1994, 12).

Therefore, the motivation to focus directly on the lives that people lead, what they succeed in being or doing. The questions to be answered for well being are whether people have the capability of living long, avoid illiteracy, freedom from hunger and under nourishment and whether they enjoy personal freedom and liberty. The basic features of well being are looking at people as the centre of all development activity. Enhancing their capabilities to function in these elementary ways is what lies at the core of human development. The basic

approach of the HDR values capabilities related to health, nutrition, basic education as ends in themselves and income is only a means to achieve these. Proponents of human development approach argues in favour of enhancing people's ability to read and write, to be healthy, even if the economic returns of investment in literacy and health care were zero.

The first HDR (1990) constructed HDI on the three essential elements of human life: longevity, approximated by life expectancy; knowledge, approximated by literacy rate and living standard, approximated by "log" of real GDP per capita based on PPP$. Judged by this new HDI, 44 countries were in the low human development (Niger 0.11 to Morocco 0.49), 40 countries in the medium human development (Egypt 0.50 to Albinia 0.79) and 46 countries in the high human development (Malaysia 0.80 to Japan 0.99) category. On the basis of these HDI values the countries were ranked and a ranking on the basis of GDP per capita was also shown in the Report. This Report revealed the value of HDI of India to be 0.44 and India's rank was 37 from the bottom of the scale but was 12 places higher than the corresponding rank in the scale of measurement based on GNP per capita.

Some other countries whose achievements in human development were higher than as indicated by their GDP per capita were Sri-Lanka, Vietnam, Myanmar, Laos, Cambodia, Thailand, Albania, Cuba, Costa Rica, Jamaica and Chile. On the other hand a number of countries mostly oil producing and exporting countries, countries of the Gulf showed their ranking in HDI to be substantially lower than their ranking on the basis GDP per capita.

The Second HDR (1991) took up the issue of financing human development and the role of the government. It concluded that the world had an enormous opportunity to increase investment in human development even with the existing resources.

The HDR 1992 extended the analysis by adding an international dimension. It focused specifically on global markets and on how they meet or failed to meet human needs. The Report discovered that global markets made developing countries a loss of economic opportunity worth about $500 billion annually which is ten times what they received in foreign assistance. The Report suggested two priority areas for further action. Firstly the LDC should invest massively in their people to sharpen their competitive edge in international market. Secondly there should be a radical dismantling of trade barriers and a major reform of international institutions to establish a new vision of global cooperation in the next century.

The HDR 1993 examined by how and how much people can and do participate in the events and processes that shape their lives. The main theme of the HDR 1993 was that of people's participation and touched on only a few aspects of a profound human revolution that

made people's participation the central objective in all parts of life. The Report included five new pillars of a people centered world order that must be build. It stressed on new concepts of human security with emphasis on the security of people and not only of nations, new strategies of sustainable human development that weaved development around people, new partnership between State and market, new pattern of national and global governance and new forms of international cooperations. A major feature of this HDR was the disaggregation of HDI by various population groups. It has also introduced new methodologies and concepts by which disaggregation within the countries could be made.

The HDR 1994 explored the new frontiers of human security in the daily lives of the people. It attempted to discover early warning signals that could spur preventive diplomacy and preventive development in order to save a society from reaching a crisis point. It outlined a new design for development cooperation in the post cold war period. It has also suggested a concrete agenda for the consideration of the World Summit for Social Development in 1995 claiming the urgency of international community to strengthen the role of the UN in the socio-economic field and to vest more decision making power in the UN to manage the new dimensions of global human security. The Report also disaggregated the HDI by various population groups and regions and presented case studies of nine countries.

The HDR 1995 analysed the process and progress made in reducing gender disparities in the past few decades. It also highlighted the wide and persistent gap, between women's expanding capabilities and their limited opportunities. It introduced two new measures for ranking countries on a global scale by their performance in gender equality. The two measures or the composite indices are the gender related development index (GDI) and the gender empowerment measures (GEM). The GDI captured gender inequality in human capabilities and the GEM reflected inequalities in key areas of political and economic participation and decision making. The Report concluded that the unvalued contribution of women was so large that any reasonable valuation would lead to a fundamental change in the premises on which today's economic, social and political structures are founded.

The HDR 1996 explored the complex relationship between economic growth and human development. The Report argued that if economic growth is not properly managed it can be jobless, voiceless , ruthless and futureless and thus detrimental to human development. It made important recommendations that all countries must strive to improve the nature and quality of their economic growth. The policies must be tailored to national circumstances. The global community can and must also help countries effect their own strategies of sustainable development.

2.2: The Concept of Well being -the base of HDI : Some Philosophical Issues

The term "quality of life", "standard of living" and "well being" are often used interchangeably to capture the concept of socio-economic aspects of life. However these terms are different from that of the term "welfare". Cohen (1993) gave two different interpretations of welfare, one in terms of enjoyment and the other in terms of preference satisfaction . These two corresponds to Sen's (1985,1987) "happiness" and "desire fulfilment" concepts. That the concept of "well being" or "standard of living" is broader than welfare is implicit in both Dasgupta (1993) and Sen (1985, 1987). Dasgupta started by distinguishing between two aspects of personhood- one views in doing things and the other sees us residing in states of being. In Dasgupta happiness or welfare belongs to the latter and the concept of well being includes both. For Sen , people's standard of living is a matter of the kind they live or what the people succeed in being and doing. Being happy, for Sen, is just one of many aspects of being that are relevant for an overall evaluation of well being.

Griffen (1986) described well being primarily in terms of prudential values - the goods making people's lives valuable to them. For him utility is best understood as a formal analysis of the concept of prudential value . Income as a measure of individual well being was first proposed by Pigou (1932). Being confronted by the difficulties to measure pleasure of happiness he proposed a narrow definition of 'economic welfare' which could be measured by using the 'measuring rod of money'. The practical advantage of income as a measure of individual's well being lies in the fact that it is a simple scalar measure of a complex flow of potential consumptive activities. Government's involvement in the provision of various goods and services breaks the direct connection between an individual's real income and his actual command over commodities. Thus one can measure individual's well being by focussing directly on the space of commodities (Chakraborty, 1995).

Rawls' (1971) theory of 'primary goods' differ in important ways from simple commodity view. Rawls listed social primary goods as rights and liberties, powers and opportunities, incomes and wealth and self respect. Rawls did not consider primary social goods as proxies of utility level but in his view they offer an alternative basis for a more settled social agreements on what is important to well being. Sen (1985,1987) argued that the standard of living is a matter of people's 'functioning' that is what they succeeded in doing or being or thei ''capabilities" to function . Sen argued for a different space in which the living standard should be evaluated.

Sen attacked utilitarianism on the ground that it was inadequate to provide a theory of well being. The main problem with the utility view of well being arose from the particular interpretation of well being exclusively in terms of the metric of happiness or desire fulfillment. The matric happiness might distort the extent of deprivation in a biased way. What Sen suggested is an alternative metric for assessing well being. His 'functioning and capabilities' approach intended to provide an alternative theory of well being.

2.3: Conceptual and Theoretical background of HDI

The concept of human development relates to the guaranteeing of sufficient resources so that basic capabilities are assumed and examines the use of these capabilities made by people (Desai, 1991). UNDP's Construction of HDI is based on the capability and functioning approach of well being.

As discussed in the earlier section (2.2), Sen (1977,1984,1985,1987) was critical of the use of both "opulence" (income, wealth or commodity possession) and "utility" (happiness, desire fulfillment or choice) as a measure of well being. This is because they constitute wrong space in which to make such assessment. Instead, Sen argues that well being has to do with being well, which in most elementary terms is about being healthy, being literate, being able to live long and so on. As Sen (1987) puts it, the value of living standard lies in the living and not in the possessing of commodities which has varying relevance. For example, to reach the same level of nutrition as another, one needs larger command over food if one has a higher metabolic rate or a larger body frame or one is pregnant or one lives in a colder climate or if food has other uses like festival. So what is valued intrinsically are people's achievement or their capabilities to function. Opulence can have importance as an instrument for expanding capabilities while utility can provide evidence of achievement. But Sen's argument is that the space in which well being should be evaluated has to be more directly linked to what matters most, not instrumental antecedents and nor its evidential correlates.

Sen's approach to well being (Sen 1985, 87, Dutta *et al*, 1994) in terms of functioning and capabilities can be briefly explained in the following way.

Let X be the commodity space with generic element x. For any individual i, the commodity entitlement is Xi, the set of commodity bundle that i can posses. Given x in X the vector of characteristics corresponding to x is given by c (x). In fact it does not give us the idea about how useful the bundle is to any specific individual. For example a book which may be treated as having the characteristic "reading pleasure" is not of much use to an illiterate person. Functioning tells us what a person can do with the commodities in his or her possession. Let

f_i be a personal utilisation mapping of individual i, generating a functioning vector out of a characteristic vector of commodities possessed by i. The set of utilisation function available to i be F_i. If individual i chooses the function fi and posses commodity bundle x, then the achieved functioning is given by the vector bi, where $bi = f_i[c(x)]$ Individual i's capability set is given by

$Bi = \{bi/bi = f_i[c(x)], f_i \subset Fi, x \subset Xi\}$

Hence the achievement in promoting well being of an individual is a vector of his functioning, the irrelevant functioning ranging from being adequately nourished, being in good health and avoiding escapable morbidity to more complex ones such as being happy or self respect . This functioning is an intrinsic part of an individual, and is quite distinct both from the commodities which are used to achieve the functioning as well as the utility or happiness achieved from the functioning. On the other hand, a capability set represents the various combination of functioning that a person can achieve. An obvious analogy is that the capability set in functioning space defines an individual's freedom to choose from possible livings just as the budget set in commodity space reflects a person's ability to buy different bundles.

In any exercise involving social evaluation the first step is to identify the objects of value. Sen defined functioning and capabilities as the objects of value. It is obvious that the functioning is an object of value as the achieved functioning indicates the quality of "being" of an individual. Sen pointed out that the well being of a person must be judged not only in terms of the actual achievements but also it must incorporate the freedom to choose between types of being.

The human development approach to the UNDP's HDR concentrated on the capability to lead worthwhile lives as the object of importance. It applied the universalist perspective to the freedom to lead lives that people today and in the future would value (Anand and Sen 1994,8). It was expressed in HDR (1990) that the term human development denotes both the process of widening people's choice and the level of their achieved well being. The Report also distinguished clearly between two sides of human development . One is the formation of human capabilities and the other is the use that people make of their acquired capabilities , for work or for leisure.

2.4: Methodology used for the construction of HDI

The HDI include three key components - longevity, knowledge and income which are combined to arrive at an average deprivation index. Longevity is measured by life expectancy at birth as the sole unadjusted indicator. Knowledge was measured by two educational stock

variable, adult literacy and mean year of schooling upto 1994. The measure of educational attainment was obtained by assigning a weight of 2/3rd to literacy and 1/3 to mean year of schooling .

$E = a_1$ literacy + a_2 years of schooling

with $a_1 = 2/3$ and $a_2 = 1/3$.

Since 1995 for educational attainment the estimate of mean years of schooling has been replaced by the combined enrolment ratio at primary, secondary and tertiary levels. This variable has been given a weight of one third and as before adult literacy a weight of two-thirds.

The HDI is based on the premise of diminishing returns from income for human development. It was an explicit formulation for the diminishing returns to be calculated. A well known and frequently used form (Dutta *et al*, 1994) is the Atkinson formulation for the utility of income (HDR'93). The new variable W is given as

$W(y) = \{1/(1-e)\}y^{1-e}$

Here W(y) is the utility or well being derived from income, and the parameter e measures the extent of diminishing returns. It is the elasticity of marginal utility of income with respect to income. If e=0, there is no diminishing returns. As e approaches 1, the equation become

$W(y) = \log y$.

The value of e rises slowly in the HDI as income rises (HDR '93). For this purpose the full range of income is divided into multiples of poverty line y*. Thus most countries are between 0 and y*, some between y* and 2y*, even fewer between 2y* and 3y* and so on . For countries with per capita income below y*, the value of e is set to be zero with no diminishing returns. For income between y* and 2y*, e is set to be 1/2, for income between 2y* and 3y* e is set to be 2/3 and so on.

In general, if a $y^* \leq y \leq (a+1)y^*$

This gives

$$
\begin{aligned}
w(y) &= y \text{ for } 0 < y \leq y^* \\
&= y^* + 2(y-y^*)^{1/2} \text{ for } y^* \leq y \leq 2y^* \\
&= y^* + 2(y)^{1/2} + 3(y-2y)^{1/3} \text{ for } 2y^* \leq y \leq 3y^*
\end{aligned}
$$

So the higher the income relative to poverty level, the more sharply the diminishing returns affect the contribution of income to human development.

The HDI is constructed in three steps. The first step is to define a country's measure of deprivation for each of the three variables- life expectancy (x1), educational attainment (x2) and adjusted real per capita GDP in PPP$ (x3). A maximum and minimum value is identified for the actual values of each of the three variables. The deprivation measure then places a country in the 0-1 scale defined by the difference between the maximum and the minimum.

Thus the deprivation indicator for country j with respect to variable Xi is defined as

$$I_{ij} = \{\max_k \{X_{ik}\} - X_{ij}\} / \{\max_k \{X_{ik}\} - \min_k (X_{ik})\}$$

The second step is to define an average deprivation indicator Ij for country j by taking the average of the three indicators

$$I_j = 1/3 \sum I_{ij}$$

The third step is to measure the human development Index (HDI) as one minus the average deprivation index

$$\{HDI\}_j = 1 - I_j$$

For example (HDR,1993), Singapore had a real per capita GDP of $15,108. The poverty line being $4,829, the equation for the determination of well being of Singapore becomes

$$w(y) = 4829 + 2(4829)^{1/2} + 3(4829)^{1/3} + 4(15108 - 14,487)^{1/4} = 5,039$$

In calculating the HDI of Singapore the following steps are taken

Max. Country life expectancy	= 78.6
Min Country life expectancy	= 42.0
Max Country educational attainment	= 3.00
Min Country educational attainment	= 0.00
Max Country adjusted real GDP per capita	= 5079
Min Country adjusted real GDP per capita	= 380
Singapore life expectancy	= 74.0
Singapore educational attainment	= 2.04
Singapore adjusted real GDP per capita	= 5039

Singapore life expectancy deprivation

= (78.6-74.0)/(78.6-42.0) = 0.126

Singapore educational attainment deprivation

= (3.00-2.04)/(3.00-0.00) = 0.320

Singapore GDP deprivation

= (5079-5039)/(5079-380) = 0.009

Singapore average deprivation

= (0.126+0.320+0.009)/3 = 0.152

Singapore HDI

= 1-0.152 = 0.848

Since HDR 1994 the above deprivation calculation and HDI methodology was slightly changed to get the direct result of HDI. Here instead of deprivation calculation indexed value of X_1, X_2 and X_3 were calculated by

$$\text{Indexed } X_{ij} = \{X_{ij} - \min_k\{X_{ik}\}\}/\{\max_k\{X_{ik}\} - \min_k(X_{ik})\}$$

Then summing for the indexed life expectancy, educational attainment and adjusted income we get the "summation" value. Dividing "summation" by 3 we get the HDI of jth country directly.

2.5: A critical review of the HDI provided by the UNDP :

The HDI was first published in the HDR in 1990 by the UNDP. It immediately attached a lot of attention by economists and researchers.

Rao (1991) started with the question whether human development as defined by HDR can assist human evolution and observed that the HDR would have achieved the highest degree of richness and fullness if it had devoted at least a small amount of space to human values as an integral part of human evolution- the evolution of the human races to manifest its real nature, that of humanness. Rao also noted two measurement problems, one relating to the use of equal weight to each of the three deprivation variable. The weighting problem may become more significant as more dimensions are added to HDI. The second problem is the way the deprivation in purchasing power was computed. In this report (1990) the logarithm of real GDP per capita was estimated to capture the income deprivation index. Rao observed that if the "logs" were discarded Kenya's HDI would become 0.383 against the earlier 0.481. If

poverty line of the industrial countries was set aside and the highest level of GDP per capita ($17,615 of the U.S) was used for the target, then Kenya's HDI would be 0.353. Rao also suggested that the measure of democratic freedom was another variable which should have been included in the HDI.

McGillivray (1991) examined both the composition and usefulness of HDI as a composite development indicator by using zero order and rank order correlation coefficients. The most striking feature of the results of zero and rank order correlation coefficients was the indication of redundancy of HDI vis-a-vis its individual components in terms of both values and ranking. The corresponding zero and rank order coefficients were both positive and statistically significant at 99% or greater level of confidence. A positive and often very large zero and rank order coefficients between HDI and GDP per capita was observed, irrespective of whether actual or logarithmic values of GDP per capita were used. Hence it was suggested that the HDI generally ranked countries in a manner not dissimilar from the way GNP per capita ranked them. Finally GNP per capita was positively correlated with each of HDI's components. Thus it was concluded that the composition of the HDI is flawed as it is significantly and positively correlated with each of its component variables individually. As a consequence assessing intercountry development levels on any one of these variables would yield similar results to those that the index itself yielded. With the exception of a minority of country group, the index largely provided with little more informations regarding intercountry development levels than the more traditional indicator, GNP per capita. Finally it was observed that the UNDP's index was yet another redundant composite intercountry development indicator.

Hopkins (1991) observed that the HDR of 1990 took up the new fashion on "meso" policies and called for "well structured" meso policies. These apparently required a mix of two main features. First, across-the - board provision of basic services to ensure that the benefits reach the deprived and second targeted schemes such as income support and food subsidies directed towards deprived groups. To be more useful to human resource planners the Report would have to discuss what human resources must be developed to meet the needs of a rapidly growing economy. This would require examining such questions as where does vocational training take over from formal education? How many trained numerical control experts does a country require? How much training should be provided by the State and how much by private sector? Hopkins also observed that the UNDP Report's policy suggestions were too general to be of very much help. Because it did not address how the government can redirect

expenditure away from costly hospitals towards primary health care without completely loosing the support of medical establishment. Nevertheless the Report was welcome for attention to human development issue, for its useful statistical annex and for its observation that poverty of people of the developing world has been no barrier to the affluence of their armies.

Kelly (1991) assessed the HDI (1990) with very wide interpretation, results and comments. He first took the view of maximum and minimum value of the indicators. For example the HDR took the adequate or derived value of life expectancy at 78, a value attained by Japan. But Kelley observed that a less exceptional and rational value might be 73, the average of developed countries in 1987 or even 71, the value of these other countries in 1975. Adopting the value 71, the HDI of China would rise from 0.72 to 0.78. Kelley also observed that problems would occur when various indicators are given equal weights. It might be argued that income should have been given a relatively higher weight. In the HDR, 1990, the developed country's poverty line was taken into consideration and then there was a log transformation. The log transformation of per capita GDP adequately captured the diminishing marginal utility of income. Kelley took a much higher value ($12,952) which is the average real per capita GDP in industrial countries as against $4861, the poverty level in HDR 1990. It was observed that the values of HDI does not appear to be particularly sensitive to the poverty line cut off, a disquiting finding. It is difficult to believe that such a large increase in per capita income would have only a small impact on enlarging "people's choice". Kelley also observed that there is plausibly diminishing marginal utility to health and education expenditure as well. He concluded that the present HDI (1990) provides only limited information on the distribution of indicators within countries and fails to include systematic information and analysis of political freedom and human rights.

Desai (1991) expressed that equal weighting to the three indicators reflect the equal importance of the three variable. But the equal weighting is not strictly true since the income variables truncated and then concavified. Thus for income it is not strictly the maximum range since many countries have actual income beyond the poverty line of the nine advanced countries. Desai also observed that the HDI fails to discriminate among rich countries as they are nearly at the maximum value of life expectancy and literacy and also they have been put at 1 (one) for the income variable. So it is necessary in future development of the index to examine ways of differentiating at the top. It was also claimed by Desai that the additivity over the three variables implied perfect substitution which can hardly be appreciated. To restrict the substitutability between the variables Desai proposed the use of log additive form. It was also

concluded that the variables like political freedom, human rights are not included in the HDI and it was suggested that the next HDR should include these variables.

Dasgupta (1990) observed that suitable increasing transformations need to be applied to each of the indicators of HDI before entering them in any aggregate measure of the state of well being or human development. The point was explained by the fact that an increase in life expectancy at birth from 45 to 46 years does not reflect the same achievement as an increase from 70 to 71 years. So an index of life expectancy at birth must be sensitive to this issue, also national income per head and literary rate should be taken care of in this regard. Dasgupta (1990,1992) took six indicators of living standard including income, life expectancy, infant mortality, literacy rate, political and civil right. The rank of the last two indicators has been taken from Taylor and Jodice (1983). It was observed by Dasgupta that political and civil rights over decades are positively and significantly correlated with growth in national income per head, with improvement in life expectancy at birth and also with improvement in infant survival rate. Political and civil rights, while not the same, are strongly correlated. Increase in national income per head is positively and significantly correlated with improvements in longevity and infant survival. Improvements in adult literacy is not correlated significantly with national income per head or with its growth or with improvement in infant survival rate. But they are negatively and significantly correlated with political and civil rights.

Anand and Ravallion (1993) attempted to identify and quantify the relative importance of the main channels through which aggregate economic growth might promote human development. The econometric study of cross countries suggested that at least for basic health, average affluence matters to the extent that it delivers lower income poverty and better public service. The commonly observed positive correlation across countries between life expectancy and affluence vanishes once the incidence of poverty and public spending on health is controlled. The same is also true for other indicators. Though both these variables matters it is notable that the quantitative significance of public health spending appears to be sizeable. Sri Lanka's example of progress of human development illustrated what the right sort of public action can achieve, independently of income.

Streeten (1994) distinguished between human resource developments and humanitarians as to whether human development concept is used as means or ends itself. He is in favour of using HDI as one indicator instead of income per head. As the distribution of literacy rate and life expectancy is much less skewed than income, the average of human indicators tells us something about the distribution. Any upward move in a human indicator may be regarded as

an improvement and also because high income can cause relative deprivation in others which is not true for human indicators. Streeten is in favour of constructing a separate index to cover the aspects of human freedom and human rights and also freedom is related to human development if they are recorded by separate indices.

Srinivasan (1994) was critical about using the HDI as it is conceptually weak and empirically unsound. It also involves serious problems of non comparability over time and space, Srinivasan argued that meaningful inferences about the process of development and performance as well as policy implications could hardly be drawn from variations in HDI.

Aturupane *et al.* (1994) analysed country progress on social indicators by using regression equations with changes rather than levels of social indicators for 71 countries. The study concluded that income growth, while important is not the primary determinant of improvement in social indicators, i.e. growth helps but it is not the only casual factor.

2.6: Further Improvement, Modification and Disaggregation of the HDI :

In incorporating income in the HDI, two major variants were tried by the UNDP. First in 1990, the logarithm of income was used rather than actual value . Second, the poverty level of 17 industrialised countries was averaged and converted to real PPP dollars. The log of this poverty level income was taken as the cut off point. If a country had per capita income above this level it was given no extra weight. The first of these two adjustments incorporated the principle of diminishing marginal utility of income and the second was designed to emphasise the interest of the HDR in poverty alleviation (HDR 1993).

In addition to the two "adjusted" HDIs for income there has been modification in other components, particularly the indicator of educational attainment. Educational attainment was originally measured by the sole indicator of adult literacy rate. But the 1991 Report broadened this measure to incorporate mean year of schooling.

In HDR 1994 a major refinement was introduced . When "goal posts" (HDR 1994) were fixed for each indicator to allow analysis over time. In the HDR 1995 two modifications were made with respect to poverty level cut off and educational attainment. The poverty level income increased from PPP$ 4829 to PPP$ 5448 and for educational attainment mean year of schooling was replaced by the combined enrolment ratio at primary, secondary and tertiary levels.

One way of improving the HDI is through disaggregation. A country's overall HDI can conceal the fact that different groups within the country have very different levels of

human development, between men or women or among different ethnic groups, different regions and States within the country or between different social class and religion. The HDR 1993 supplied separate HDI for different countries based on the availability of data. The HDR 1994 included mere countries in the work of disaggregation.

2.6.1 : Gender -disparity-adjusted HDI.

One of the most significant differences within the overall HDI score for any country is between men and women. In different countries life expectancy and literacy data are generally collected and analysed by gender. But for income, there is no way to determine how males and females share total GDP. The HDR 1993 had comparable data on relative wage and relative labour force participation rate between male and female workers in 33 countries . These data revealed the male-female wage ratio for 33 countries ranged from a low of 51% in Japan to a higher of 89% in Sweden. Again the HDR 1994 took care of 43 countries and almost the same result appeared for male -female wage ratio. In labour force participation the lowest male-female ratio was 40% in Costa Rica and the highest at 92% in Sweden in 1993 Report. In HDR 1994 the female-male ratio of non agricultural labour force participation revealed to vary between 22% in Bahrain to 89% in Finland.

In the HDR 1994 the above two ratios were multiplied to give an overall "female-male income ratio" for separate countries. The Report claimed that such ratios can print only a partial picture, but still they reveal remarkable pattern of discrimination. The Report (1994) observed that the combined ratio ranged from 21% in Bahrain to 83% in Sweden of the 43 countries where gender disparity HDI was calculated. Among the 43 countries 14 had ratio below 40% and only 11 had ratios above 60%. The Report concluded that even these disparities under estimated discrimination since female- male income differences are generally greater in agriculture and services than in manufacturing.

After calculation of gender disparity adjusted HDI for 43 countries in HDR 1994, no country improved its HDI value after adjustment. All countries treated women worse than men. But some countries do less badly than others. For example Japan got the rank from 3 to 19; Canada from 1 to 9 ; Switzerland from 2 to 17. Countries improved their rank after adjustment were Denmark from 15 to 4; Sweden from 4 to 1; Finland from 16 to 3 and New Zealand from 18 to 8.

In this calculation of gender disparity adjusted HDI a very simple method was used. First , female value of each component was expressed as a percentage of male value. These percentages were calculated separately for income, educational attainment and life expectancy. Then they

were averaged to give an overall gender gender-disparity factor. A country's overall HDI can then be multiplied by this factor to give gender disparity adjusted figure if the relevant data was available.

2.6.2: Income-distribution-adjusted HDI.

In many countries particularly, in developing countries income distribution is badly skewed. But a rich man cannot live a thousand times larger than a poor person, though their income may be in this ratio. Across countries the range of life expectancy is 42 to 72 or less than 2:1. Similarly the percentage of adult literacy varies from 18% to 99% a ratio of less than 6:1. In HDR 1993 it was observed that the range of GNP per capita over countries varied from $80 to $32,250 or a ratio of 403:1. For real GDP per capita the range was $367 (PPP) to $ 21,449 (PPP) or 58:1. This makes it important to discount the income component of HDI to reflect mal distribution of income.

In the HDR 1993, the ranking of per capita income was adjusted by multiplying a factor indicating distributional inequality-one minus the Gini Coefficient (1-G). In the 1993 Report for 41 countries data was available on the ratio of income share of the highest 20% to the lowest 20%. Of these 17 had data on Gini Coefficient as well. A strong association was found between the logarithm of the ratio of income share and the Gini Coefficient. So this regression result was used for another 11 countries to interpolate the Gini Coefficient.

In the HDR 1994, for income disparity factor the share of income of the bottom 20% of population was divided by the share of the top 20%. Multiplying this ratio by the country's overall HDI, the income-distribution adjusted HDI was obtained. This modified HDI for 55 countries was presented in the 1994 Report. No country has a perfect income distribution. Hence adjusting the HDI for income distribution reduces the score for all.

Among the industrial countries, the rank of Belgium improved nine place and that of Germany by seven. But other countries deteriorated significantly. Canada and Switzerland lost seven places and Australia by eight. In developing countries the income disparities appeared to be greater. Brazil's HDI ranking dropped by 7 places, Bostwana by eight places. But the improvement in ranking was observed for China by six, Sri Lanka by seven and Jamaica by eight.

2.6.3: Change in HDI over time :

In calculating the HDI, the minimum value of each indicator was set at the level of the poorest performing country and the maximum at the best performing country. Any country's

HDI components were thus its position between the best and the worst value. But the value of the maximum and minimum changed each year following the performance of the countries at extreme ends of the scale. This type of scaling change over years can produce frustrating results. An example can help better understanding (Griffen and Mckinley, 1993).

Let us suppose the life expectancy of Ruritiania in period 1 to be 40, halfway between minimum of 20 and maximum of 60. By period 10 Ruritiania may have improved its life expectancy to 50 but the minimum value may now be 30 ,and maximum 80. In such a case, the numerical value of the index indicating life expectancy in the HDI calculation falls from 0.5=[(40-20)/(60-20)] to 0.4=[(50-30)/(80-30)], despite the 25% improvement in life expectancy for the country over 10 years.

To solve the problem the HDR 1994 observed the importance of fixing the "goal posts" of maximum and minimum value of each indicator. These minimum and maximum are not observed values in the best and the worst performance but the most extreme values observed or expected over a long period. With the new fixed goal posts the minimum and maximum values of life expectancy are 25 years and 85 years. Demographic and medical information suggested these values. The corresponding values for adult literacy are 0% for minimum and 100% for maximum. The mean year of schooling has been fixed at 0 and 15 for minimum and maximum values. Similarly recent economic growth rates indicated that the maximum income that the richest countries are likely to achieve by 2020 A.D. is PPP$ 40,000 and the minimum to be PPP$ 200.

The main advantage in fixing the goal posts is that it can permit comparisons of the HDI over time. The comparisons over a period 1960-92 was shown in the HDR 1994, which revealed that all countries made substantial progress in human development. Between 1960-92 the overall HDI for the developing countries increased from 0.260 to 0.541. Many countries have shifted to higher human developed category, 30 countries moved from low to medium , 20 from medium to high and 4 from low to high category. The HDR 1994 concluded that no country saw its HDI value fall over this period, unlike GDP which has on occasion fallen in several countries. Hence human capital, once build up, is more likely to be sustainable (HDR 1994).

2.6.4: Disaggregation of the HDI.

There are very significant disparities within each country among ethnic group, among sub regions, between urban and rural areas and also between males and females. In the HDR 1993, it was expressed to be unfortunate that there was no sufficient data to present

disaggregation in most of the countries. In the HDR 1993, the disaggregation of HDI has been provided only for five countries, the United States, Mexico, India, Turkey and Switzerland. In the U.S. the disaggregation has been worked out for white, black and hispanic population separately . In India, the HDI in Uttar Pradesh was a third lower than the national average and 60% than that in Kerala. For Switzerland the disaggregation was made by region, for Mexico by State and for Turkey by region and gender.

Disaggregated HDIs were arrived at by using the data for HDI components pertaining to each of the groups into which the HDI was disaggregated, treating each group as a separate country. The methodology remained the same as for the national HDI.

In the HDR 1994 disaggregated case studies were prepared for nine countries further. These were South Africa, Brazil, Nigeria, Egypt, China, Malaysia, Canada, Germany and Poland. In case of South Africa disaggregation has been worked out between black and white. In Brazil a regional and income group disaggregation has been worked out. For Nigeria disaggregation by regional disparities, for Egypt between rural and urban, for Malaysia among communities, for Canada among aboriginals, for Germany, Poland and China regional disaggregation has been worked out and reported in the HDR 1994.

2.7: Further Improvement of Indicators since HDR 1995 :

An extremely valuable and innovative contribution of HDR 1995 was the construction of gender related development index (GDI) and gender empowerment measure (GEM) introducing further disaggregation. The GDI concentrated on the same variables as the HDI but focussed on both the inequality between men and women as well as on the average achievement of all people taken together. Actually the GDI is basically the HDI adjusted for gender inequality.

The GEM is an index to focus on three variable to reflect the participation of women in political decision making, their access to professional opportunities and their earning power. The GEM gives some indication of how much women are empowered in these spheres in different countries.

The GDI measures achievement in the same basic capabilities as the HDI does, but takes note of inequality of achievement between men and women. The methodology used in HDR 1995 imposes a penalty for inequality, such that GDI value decreases when the achievement levels of both women and men in a country go down or when the disparity between their achievement increases. The greater the gender disparity in basic capabilities, the lower a country's GDI compared to its HDI. (HDI 1995)

The GEM examines whether women and men are able to actively participate in economic and political life and take part in decision making. While GDI focuses on the expansion of capabilities, the GEM is concerned with the use of these capabilities to take advantage of the opportunities of life.

The HDR 1995 produced GDI for 130 countries and the GDI was always lower than the HDI because of the existence of gender inequality in every country. The GEM was estimated for 116 countries. The ranking showed that some developing countries outperformed much richer industrial countries in gender inequality in political, economic and professional activities. It was concluded that in most countries, industrial or developing, women are not yet allowed into the corridors of economic and political power. In exercising real power or decision making authority, women are distinct minority throughout the world (HDR 1995).

In the HDR 1996, a new index named Capability Poverty Measure (CPM) was introduced for 101 countries. CPM is a simple index composed of 3 indicators that reflect the percentage of people with capability shortfall in 3 basic dimensions of human development. These are (1) living a healthy, well nurished life, (2) having the capability of safe and healthy reproduction and (3) being literate and knowledgeable. The corresponding indicators are (a) % of children under 5 who are under-weight, (b) % of births unattended by trained health personnels (c) % of women aged 15 and above who are illiterate. That is CPM focuses on people's lack of capability rather than average level of capabilities in a country as done by HDI (HDR, 1996)

2.8: The path we follow :

The primary objective of this study is to construct the HDI of States of India and the districts of West Bengal with the indicators used by the UNDP and also different indicators suggested by others. Though the HDR 1995 introduced a new scope for women study, we shall not enter into this area. In our study we shall not concentrate on either gender-based or urban-based HDI study at micro-level. This is partly due to non-availability of relevant data at the micro-level and partly because it may make our present study unwieldy. Hence we leave the area of sex-biasedness or urban -biasedness from our study. For the same reasons we do not attempt to construct the CPM for the States India.