

Human Development Index:
Exercises in Methodology and Reconstruction

Supported by
Indian Institute of Public Administration

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PREFACE

This project on 'Human Development Index: Exercises in Methodology and Reconstruction' is sponsored by the Indian Institute of Public Administration from its project fund. The scope of this project is limited to methodology of constructing Human Development Index, which, to quote Amartya Sen (1999), the Human Development Report has made something of a flagship. It has been said to be successful in serving as an alternative measure of development, supplementing GNP.

An attempt has here been made to suggest modifications in the construction of the Human Development Index as well as in the methodology of combining various elements into the final index.

The United Nations Development Fund (UNDP) has been publishing every year 'Human Development Report' since 1990. When Mahbub ul Haq joined the UNDP as a special advisor, he decided, in consultation with some of the prominent development economists, to bring out state of affairs in different countries with regard to what may be called the human outcomes of development practiced in different countries. This was to some extent in contrast with 'World Development Report', being brought out by the World Bank since 1978, which focuses as much on input processes as on outputs and outcomes. In fact, since late seventies some interface was forged between development economics and welfare economics; both were changing their earlier hues. Time was opportune for such a stock taking.

However, an idea was also toyed to have an index, which could at least supplement if not replace the gross domestic product. The proposal was found to be quite crude. Yet, to

quote Amartya Sen, Mahbub ul Haq was willing to have one as long as it was no more 'vulgar' than GDP. Thus, came into being what is called Human Development Index.

As in every report the UNDP dealt with a different theme relating to or related with Human Development, it went on developing a number of Development Indices and Deprivation Indices. Human Development Index is one of them but most important as it is in terms of this index that the state of affairs of a country vis-à-vis other countries are judged when the Report is reported in the newspapers. It is this index, which almost all—national, sub-national and supra-national, by more than 120 countries and 10 regional organizations—reports have attempted to prepare.

While Human Development Index was revised a number of times in terms of its methodology of construction, there were proposed other indices as well. For example, in early years, Human Freedom Index (due to Charles Humana) and Political Freedom Index were also tried but later abandoned. Gender Empowerment Measure, however, continued. Human Development Index was adjusted for income inequality or a few years but later on the idea was dropped. It was proposed that Human Development Index should be disaggregated for significant disparities such as male-female, rural-urban, white-black but the attempt in the matter of gender disparity only survived. Starting with disaggregated male and female human development indices and trying to make a gender equity-sensitized indices, the UNDP finally proposed in 1995 what came to be known the Gender Development Index.

Instead of one single universal HDI, a proposal was mooted (by Anand and Sen, 1993) that different components should be used for computing HDI for countries falling in different levels of HDI. In fact the proposal is that first compute the basic HDI with one

proximate variable for each dimension, then find out the level. For countries falling in the medium range of basic HDI, add one more proximate variable in each dimension. For countries falling in the high range of basic HDI, add still one more proximate variable in each dimension. However, the proposal was not pursued by the UNDP or any other agency.

Then were proposed Capability Poverty Measure and Human Poverty Index. Capability Poverty Measure seems to have been dropped while Human Poverty Index has two versions—one for the poor countries and the other for the rich countries. See Appendix for the measures that came and went as well as those that stayed.

In this project, I have concentrated only on Human Development Index proper. I leave to consider other indices for future if I get an opportunity and they afford to survive.

Shri Jay Prakash Pradhan (now with Research and Information System for Non-Aligned and Other Countries) carried out some of the empirical exercises contained in this Report. However, many exercises had to be discarded as such variables got included in those exercises as do not deserve to be a part of human development index though less careful scholars have been falling in that trap. Nevertheless, he deserves my thanks for his enthusiasm and impatience, which I actually loved when he was with me.

It may be found worth noting that more than five hundred human development reports have been prepared by about 120 countries, many states within countries and several regional research institutes. This fact is noted by the UNDP as success of its venture in the area. But it is important to note that none of the developed countries found it of interest to bother about such an exercise. In fact, most of the developed countries do not

send information about their adult literacy to the UNESCO. This is a serious reflection on the attitude of the developed countries on 'human development'.

Appendix: Indices Attempted in various HDRs

Each report undertook one or more new, somewhat different, but connected themes for discussion and analysis. Each report also came up with new indices besides the core index, viz., Human Development Index. However, only some of them survived. We can list them as below:

1990: HDI, MHDI, FHDI.	1997: HDI, GDI, GEM, HPI,
1991: HDI, GSHDI, DAHDI, MHDI, HFI.	1998: HDI, GDI, GEM, HPI-1, HPI-2
1992: HDI, GSHDI, IDAHDI, PFI	1999: HDI, GDI, GEM, HPI-1, HPI-2
1993: HDI, GDAHDI, IDAHDI	2000: HDI, GDI, GEM, HPI-1, HPI-2
1994: HDI, GDAHDI, IDAHDI, DHDI	2001: HDI, GDI, GEM, HPI-1, HPI-2; TAI
1995: HDI, GDI, GEM	2002: HDI, GDI, GEM, HPI-1, HPI-2
1996: HDI, GDI, GEM, CPM	

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MOTIVATION

While I have tried to consider all revisions made by the UNDP and the suggestions made by scholars, as far as I could gather information, my main emphasis lies on the treatment of income component, which, despite two revisions, continues to be flawed in HDI exercises conducted by the UNDP. This is one solid reason for undertaking this project. But there are others too.

Human Development Index to begin with was inter-temporally incomparable as far as performance of a country was concerned as maximum and minimum values of different indicators, which were used in the construction of the index, were selected from the contemporary performance of all the countries for which comparable data could be gathered. Later, while comparability on this count was somewhat ensured in later years by selecting maximum and minimum values from recent history rather than contemporary history, revision in one or the other step of its construction rendered human development indices for various countries, as given in annual reports, inter-temporally incomparable.

Occasionally, exercises for a few countries for inter-temporal comparison were carried out. For example, in 1992 Report, HDI was computed for 1970 and 1990 in a technical note. It was repeated in 1993 Report but the values for 1990 changed, let us believe on account of updated dataset. From 1994 Report to 1998 Report, we find that HDI

was computed for 1960, 1970, and 1980 besides for a few years in the nineties. Revisions in the figures were marginal.

I was not satisfied with the UNDP treatment of one of the components and therefore wrote a paper, which was well appreciated by the referee of the journal I sent the paper for publication: he insisted I should try to provide an alternative. I hope I succeeded in meeting his expectations by proposing an alternative formulation.

The UNDP also carries out inter-temporal exercises for many countries after a major revision in methodology but people remember only what is flashed in the media when a report comes out. The UNDP exercises are purportedly international exercises but the revisions in methodology have shown how problematic, if not hollow, the human development index exercises have been. If the UNDP could have continued with the same methodology as it adopted in 1991, India would have been categorized as a country with low HDI even in 2002, whereas according to new methodology, it had crossed the threshold by 1990 itself.

In 1999 a significant change was made in treatment of that component. It gave a table showing how the values of HDI changed for the data as used in 1998 Report for about 100 countries. India was not included. The UNDP (1999, p.160) made the following observation:

First, most of the changes in HDI rankings can be attributed to the changes in the treatment of income. Second, although a simple comparison of the HDI values in last year's Report with those of this year's shows an apparent deterioration, a comparison using the new treatment of income in both cases shows an improvement in the HDI value for every country.

This statement is incorrect as it is clear from the perusal of the table referred to that only high HDI countries' or rich countries' HDI values deteriorated with a few exceptions

while those of others improved. But this is not our contention. Our contention is that a body as influential as the UNDP in moulding public opinion should not come out with such indices without adequate work.

The UNDP divided the countries in the categories of low, medium and high level of human development, depending upon whether their score was below 0.5, between 0.5 and 0.8 or above 0.8. Leaving aside the substantial weaknesses that the Index has, the status of a country depends on the methodology, which a simple researcher and even an intelligent bureaucrat shall never be able to discover. So much so that that number of countries in high HDI bracket and low HDI bracket reduced, on revision in methodology in 1999, from 64 to 45 and from 44 to 35 respectively, that in medium HDI bracket increased from 66 to 84. HDI values did change marginally due to achievements or failures in certain spheres but methodological changes have changed them completely.

The reluctance on the part of the UNDP for revision seems to be somewhat valid. It thought frequent revisions would cause inconvenience to the users (though they had in mind in 1993 to amend their formulation). Yet, it could not continue grossly with faulty construction. The UNDP had brought about many changes in methodology rather quietly—without informing the reader about its implications. To begin with, for example, they had added percentage figures with number of years figures in the educational attainment index.

This is important to note that it seems they were prepared in 1993 to replace piecemeal Atkinson by simple logarithmic transformation for getting well-being returns to income. To make this change, the UNDP team took eight long years. In order to appreciate the point, one may look at the Table 1, which put together the HDI values, as available in

different HDRs along with those given by our own NHRD (National Human Development Report, 2002) by the Planning Commission.

TABLE 1: VALUES OF HUMAN DEVELOPMENT INDEX FOR INDIA ACCORDING VARIOUS HDRs

HDR Year	Data Year	HDR	HDR 1992	HDR 1993	HDR 1994	HDR 1997/8	HDR 2000	HDR 2001	HDR 2002	NHRD 2001
	1960				0.206	0.206				
	1970		0.258	0.258	0.254	0.254				
	1975						0.405	0.406	0.407	
	1980				0.296	0.296	0.431	0.433	0.434	
	1981									0.302
	1985						0.470	0.472	0.473	
1990	1987	0.439								
1991	1988	0.308								
1992	1990	0.297	0.297	0.309			0.510	0.510	0.511	
1993	1990	0.309								
	1991									0.381
1994	1992	0.382			0.382	0.382				
1995	1992	0.439								
1996	1993	0.436								
1997	1994	0.446				0.446				
1998	1995	0.451				0.451		0.544	0.545	
1999	1997	0.458								
2000	1998	0.456					0.563			
2001	1999	0.571						0.571		
2002	2000	0.577							0.577	
	2001									0.472

Notes: 1. HDR 1992-1995 give data on life expectancy and real per capita GDP in PPP\$ for 1960 also. In the absence of data for other two variables, it seems, they did not give HDI values for 1960.

We can glean from this Table that just due to change in methodology

- (1) For the year 1980, the change is as much as 45 per cent;
- (2) For the year 1990, the change as much as 65 per cent;
- (3) For the year 1995, the change is as much as 20 per cent;
- (4) India was already a country with medium HDI values in 1990 when the UNDP started its exercise. By earlier methodology, we had HDI equal to 0.45 and would have had to have five more years to cross the hump of 0.5.

One can look at an interesting exercise, which compares India with Pakistan. See Table 2. According to old methodology, Pakistan was doing better in the nineties and not much worse in the eighties than India. According to the new methodology, Pakistan never

fared better than India and the absolute gap is somewhat rising. Which one should we accept? Is it a comparison of performance between India and Pakistan or that between the two methodologies? This is a serious matter. How eloquently does the UNDP accept their mistake?

TABLE 2: COMPARISON OF INDIA AND PAKISTAN BY OLD AND NEW METHODOLOGIES

	1960	1970	1975	1980	1985	1990*	1995	2000
Old Methodology								
India	0.206	0.254		0.296		0.382	0.451	
Pakistan	0.193	0.244		0.287		0.393	0.453	
New Methodology								
India			0.406	0.433	0.472	0.510	0.544	0.571
Pakistan			0.343	0.370	0.403	0.441	0.476	0.499

* The year for the old methodology is 1992. For the year 1990, according to HDR 1993, the values are 0.310 for India and 0.311 for Pakistan while according to HDR 1992, they are 0.297 for India and 0.305 for Pakistan. The basic source for old methodology is HDR 1998 and for new methodology it is HDR 2002.

The UNDP puts a lot of emphasis on inter-country ranking. It has asserted (HDR 1992, p. 19):

It may be recalled that the HDI does not measure absolute levels of human development. It ranks countries in relation to each other, according to how far they have come from the lowest levels of achievement and how they will have to travel towards the present highest level of achievement on each of three indicators.

I very much doubt if anybody or any body could write more absurd an assertion than this. It is only on the basis of absolute values that countries could be ranked. Moreover, it is in terms of absolute achievement that all countries can perform better. But in terms of rank, someone has to be at the top and somebody at the bottom, unless in most unlikely possibility when every country attains the same level of Human Development Index. Supposing all countries attain at value of 0.5 and therefore all are ranked number 1, is it something to be very happy about? If all countries attain the same value say 0.97, should they stop improving? Again if they improve at differential rates, they will have

different ranks. And should a country with the present highest achievement in all three dimensions stop improving, as seems to be the implication of the quotation?

A country's rank depends not on its performance but on that of other countries as well. Most of the times, it so happens that absolute improvement in a country's human development gets completely ignored so much so that India's movement from low level to medium level went unnoticed. Sometimes HDI is not calculated for some of the countries and depending on the rank-positions of these countries, ranks of many other countries get changed. It is only after some research that one is able to find that though India's HDI had improved its rank had not improved: only exclusion of certain countries had pushed its rank up in 2001 by 12 notches. This overemphasis by the UNDP on ranking of the countries irrespective of the fact whether the countries are comparable, say by the size of population. This is not proper. There may be several pockets in India, which may be likened with Singapore. Further, supposing that tomorrow 15 European States completely unify to make the European Union a single country, many countries will move up by 14 notches.

This comparison blurs the fact of progress by a giant simply because many a pygmy can jump up or down. It is too mechanical. (All such comparisons—such as of Nagaland with Uttar Pradesh—are highly questionable as a little help from Uttar Pradesh would move Nagaland far ahead while the whole of Nagaland cannot support even a single district of Uttar Pradesh.). As our Prime Minister has mentioned in the context of globalisation, when an elephant moves it create stir even when its pace is low. We cannot change geography or history but we can surely be careful in comparisons.

An inter-temporal progress of a country (for that matter, any other unit) is much more meaningful than an inter-national comparison at a point of time. To put weight to this

observation, let me quote our present Deputy Chairman of our Planning Commission who said in one of the Seminars held in ICRIER: Emphasis should therefore be laid on absolute numbers. It may be pointed that the UNDP (1992, p. 23) itself tries to place weight when it points the size of Uttar Pradesh while telling about its rank (143) in comparison to India's 121.

The idea of progress of a nation by methodology of measuring index rather than technology of production should not be acceptable. Therefore, an attempt to improve the methodology within a very limited framework has been attempted.

Appendix: Exercises on Indian States

Shiva Kumar (1991), Tilak (1991), Pal and Pant (1993), Population Foundation of India (1997) and Planning Commission (2002) are some of them. We report them below. A study by Dutta, Panda and Wadhwa (1997) is definitely important but they seem to have chosen to avoid construction of overall index. Many states have prepared district-wise human development index too.

	Shiva Kumar 1991	Tilak 1991	Pal and Pant 1993	Population Foundation of India 1997	Planning Commission, 2002		
					1993	1981	1991
INDIA				42.79	0.302	0.381	0.472
Andhra Pradesh	0.397(09)	0.361(09)	0.289(09)	41.28 (09)	0.298 (09)	0.377 (09)	0.416 (10)
Assam	0.372(10)	0.256(10)	0.282(10)	39.48 (10)	0.272 (10)	0.348 (10)	0.386 (14)
Bihar	0.306(14)	0.147(14)	0.106(14)	34.05 (15)	0.237 (15)	0.308 (15)	0.367 (15)
Gujarat	0.465(08)	0.566(05)	0.416(07)	47.82 (06)	0.360 (04)	0.431 (06)	0.479 (06)
Haryana	0.514(04)	0.624(04)	0.518(04)	50.56 (05)	0.360 (05)	0.443 (05)	0.509 (05)
Himachal Pradesh				50.63			
Karnataka	0.475(06)	0.502(07)	0.438(06)	46.83 (07)	0.346 (06)	0.412 (07)	0.478 (07)
Kerala	0.651(01)	0.775(01)	0.762(01)	62.79 (01)	0.500 (01)	0.591 (01)	0.638 (01)
Madhya Pradesh	0.344(13)	0.196(13)	0.156(13)	36.71 (13)	0.245 (14)	0.328 (13)	0.394 (12)
Maharashtra	0.532(03)	0.655(03)	0.598(03)	55.49 (02)	0.363 (03)	0.475 (04)	0.523 (04)
Orissa	0.348(11)	0.224(12)	0.180(11)	37.25 (11)	0.267 (11)	0.345 (12)	0.404 (11)
Punjab	0.586(02)	0.744(02)	0.680(02)	54.86 (03)	0.411 (02)	0.475 (02)	0.537 (02)
Rajasthan	0.347(12)	0.246(11)	0.160(12)	37.11 (12)	0.256 (12)	0.347 (11)	0.424 (09)
Tamilnadu	0.483(05)	0.508(06)	0.454(05)	51.11 (04)	0.343 (07)	0.466 (03)	0.531 (03)
Uttar Pradesh	0.292(15)	0.110(15)	0.070(15)	35.51 (14)	0.255 (13)	0.314 (14)	0.388 (13)
West Bengal	0.467(07)	0.436(08)	0.382(08)	45.37 (08)	0.305 (08)	0.404 (08)	0.472 (08)

CONCEPT OF HUMAN DEVELOPMENT

Introduction: Human Development Arrives

Not long ago, the phrase 'human development' signified evolution of mankind – biological and sociological or even technological. It was also used to connote the idea of development to find whether the process or its outcome was 'humane'. It was also used in more generic sense in certain titles. It was however not given a technical meaning until 1990. Now in foreseeable future nobody in the civilized world would dare use the phrase in any other sense as it has now received an international stamp, though not a patent, thanks to quite a few contributors from the poor world.

The United Nations Development Program was however not the first use to use the phrase Human Development, the way it is understood today in the literature on development, though it seems to have succeeded in replacing the older meaning, which related the term to biological evolution of mankind or human being from hominids to homo faber to homo sapiens. As efforts of international aid, cooperation and expertise seemed to have resulted in lukewarm success in development (despite declarations of two international development decades), a doubt about the strategy was but natural. While Dudley Seers dismissed as development what happened since the early fifties, of the many ideas that were promoted one was human-centred development.

However, for the sake of history, we may note that the International Bank of Reconstruction and Development had devoted second part of its third World Development

Report, published in 1980, to 'Poverty and Human Development'. President Robert McNamara, while underscoring the need for growth and for meeting basic needs, increasing employment, reducing inequalities and raising productivity of the poor, emphasized in his Foreword on the importance of human development that education and training, better health and nutrition, and fertility reduction have been shown to be important not only in alleviating poverty but also in increasing the incomes of the poor and GNP growth as well. It is pointed out in the report (World Bank, 1980, p.33) that human development is not only, or even primarily, an economic one but removal of hunger, reduction in child death and increase in primary education are accepted as important ends. It underlined that health and education were, besides having instrumental significance, primary aims of development. However, while the report does not try to distinguish human development from human resource development, it says that it is calling human resource development as human development because the elements of human resource development are themselves ends of development. Many of its background papers did use the term human development.

However, the first clear expression of the present meaning and intentions of the term Human Development comes from an unsuspected quarters, hardly a referred to contribution, which is by Jyotirindra Das Gupta (1981, p.6) who wrote:

Human Development indicates a better ability of people to choose; what they end up choosing is another matter.

Admittedly the time was not then ripe; and nobody paid any attention. It came in 1990. There had elapsed a period of crises leading to retrenchment of people, in global context, where concern for people gave way to concern for balancing budgets and

payments. Responding to this human concern, the development agency UNDP, under the leadership of Mahbub ul Haq, came up with the idea of Human Development in the first Human Development Report published in 1990. To quote from a special contribution made by Paul Streeten in tenth Human Development Report (1999), which echoes like philosophy of *sarvodaya*,

In 1990 the time had come for a broad approach to improving human well-being that would cover all aspects of human life, for all people, in both high-income and developing countries, both now and in the future. It went far beyond narrowly defined economic development to cover the full flourishing of all human choices. It emphasized the need to put people—their needs, their aspirations and their capabilities—at the center of the development effort. And the need to assert the unacceptability of any biases or discriminations, whether by class, gender, race, nationality, religion, community or generation. Human development had arrived.

So, everything has its time. Human development so far insisted upon by so many countries in their plan documents, programmes and schemes pursued by their respective national governments was not given due recognition to because the so-called international experts and agencies had not thought so and had given little recognition but not a seal of approval. These giants were, people with the UNDP recognized, Aristotle, Kant, Petty, King, Quesney, Lavoisier and Lagrange, but not our (feeble) efforts to breakaway with the western prescriptions for modernization symbols or even what earlier plan documents echoed. Later plan documents were eulogized because they used the phrase human development. For example, the Eighth Plan, Vol. 2, Chapter 11 started with a sentence which reads 'It is now universally acknowledged that the goal of Plan efforts is human development, of which human resource development is a necessary pre-requisite'. The phrase was never again used but it had recognition from the agencies like the UNDP. One

may question whether 'human development' was out of focus in the aid strategy of the West or in the development strategy of the underdeveloped world?

Anyway, there is no doubt, when it came with a big bang and a term from biologists, anthropologists, psychologists and historians, which rightly belonged to them, was successfully snatched. Good pushers can always do it well. It has now caught the world's imagination in terms of stimulating criticism and debates in journals and seminars, ingenious exercises in elaborations, improvements and additions are on. T. N. Srinivasan (1992) who found the UNDP index flawed, is not referred to by any scholar associated with this international effort.

Development of the Concept

It has been underlined in the Human Development Reports that previous concepts of development had often given exclusive attention to economic growth, which was understood to ultimately benefit everyone. That did not happen. According to these reports, Human Development offers a much broader perspective. It accepts that no society has in the long run been able to sustain the welfare of its people without continuous injections of economic growth but asserts that growth alone is not sufficient—it has to be translated into improvements in people's lives. Economic growth is not the *end* of human development; it is the other way round. It is one important *means*.

What is then Human Development? According to the Human Development Reports annually produced by the United Nations Development Program (and replicated by various national/sub-national governments for their respective jurisdictions and by some research organizations for regional blocks comprising a few nations, such as Mahbub ul Haq Centre for Human Development), Human Development is an approach, it is a perspective, it is a

process, it is a concept, it is a paradigm and it is a level as well. It has been variously described.

Development itself has been accepted as a process as well as a level. Various HDRs, though eloquent otherwise, fail to do full justice in explaining and defining human development as will be evident from the Appendix giving gist of how different reports tried to explain it. Their confusion about choices and capabilities and capabilities and functionings are all too evident. Many of them started with opening sentence that people are wealth of a nation (or of the nations), which is what I feel the protagonists of human development approach sought to debunk. Therefore, siding with the process view, I quote here from the same source Streeten again, who has succinctly described the intent of the concept of Human Development. He holds:

Human Development is the process of enlarging people's choices—not just choices among different detergents, television channels or car models but the choices that are created by expanding human capabilities and functionings—what people do and can do in their lives. At all levels of development a few capabilities are essential for human development, without which many choices in life would not be available. These capabilities are to lead long and healthy lives, to be knowledgeable and to have access to the resources needed for a decent standard of living—and these are reflected in the human development index. But many additional choices are valued by people. These include political, social, economic, and cultural freedom, a sense of community, opportunities for being creative and productive, self-respect and human rights. Yet human development is more than just achieving these capabilities; it is also the process of pursuing them in a way that is equitable, participatory, productive and sustainable.

One could pose a few quick questions. First, whether the few capabilities especially mentioned are part/constituents of human development as human development index is purportedly based on these or they are essential for human development as has been asserted above. Two, whether these capabilities are essential for choices people wish to make or they are themselves choices, as has been asserted by good number of Human

Development Reports. Three, whether human development refers to people's actual achievement in terms of beings and doings or to their capability to choose to be and to do. Whether it is proper to put together the notion of being and that of doing, while being clearly denotes one's persona itself and doing, one's capability.

However, it has been very well pointed out by Streeten that choices, which may change over time and can be infinite, would be mindless and pointless. There are limits and constraints on choices and in fact they need to be combined with allegiances—rights with duties, options with bonds, liberties with ligatures. Extreme individualism is more than methodological and may need to be curbed by communitarianism. The exact combination of individual and public action, of personal agency and social institutions, will vary from time to time and from problem to problem. Institutional arrangements will be more important for achieving sustainability while personal agency more important when it comes to the choice of household articles or marriage partners.

As pointed out clearly in Human Development Report 1992, the UNDP decided to re-examine the basic concept and its measurement each year and this they did. Thus, it not only took up a different theme every year but also came up with a new index or some change in the formulation of one of the indices or even discarded one of them. According to Anand and Sen (2000, p.85), the Human Development report have chosen a two-tiered approach to address this issue:

- (a) presenting a variety of relevant information in detail (with investigation of their respective roles, analyzed in different reports, varying from year to year; and
- (b) providing a summary picture of some of the major components of human development through a Human Development Index (HDI) to serve as an alternative focal point to the traditional concentration on the GNP, GDP, and other standard measures of economic development.

Basic Idea of Human Development

The idea of Human Development is built around the notions of capabilities and functioning. Capabilities of a person are defined in terms of his/her beings and doings: in terms of what one can be and what one can do. Capabilities are further defined in terms of a set of vectors of functionings. Each single vector is an option. Larger the set of vectors of functionings, it seems, the larger the choice. Among the crucial functionings that are central for quality of life, Sen would include 'avoiding escapable morbidity', 'preventable mortality', 'being educated', 'having comfortable life', 'achieving self-respect and respect from others', 'being socially integrated', etc. I will use simpler examples. It is not the matter of people's actual (achieved) functionings, it is pointed out time and again, but their capability to achieve the functionings they have reason to choose, as the latter signifies the importance of freedom to choose.

There is some need for liberty to use words, particularly word capability, in singular and plural numbers as Sen has taken some liberty from the dictionary to use the terms.

Functioning depends on the capability but also on commodities. Let me use word functioning in the sense of doing, which makes better sense. I can swim only when there is water in the pond/pool but I must have capability to swim. I can read what I wish provided I have capability to read and there is a book I want to read. If I am blind I can read only if I know Braille, that is I have capability to read Braille, and there is a book available in Braille. If I am hard of hearing, I can hear only if I have a hearing aid: here commodity enables me, makes me capable of. So is the case when I have poor eyesight. Such aids in the view of many people are extensions of my organs. Nevertheless they make one capable of doing certain things. Can they be considered part of my being is doubtful but my

artificial teeth make me capable of eating many things I love to. Therefore, some scholars like Martha Nussbaum have tried to distinguish I-capabilities from E-capabilities, which Sen did not. But the point that I am making is that I can eat only when things are there. I have to be computer literate in order to chat but I can do it only when I have access to internet facility.

Opportunity provided for in the being is capability and opportunity provided for outside the being is commodity. Good is better word for commodity. Things produced for oneself, for the kin, for friends and others, without intent of quid pro quo, are goods, not commodities. While all commodities are goods, all goods are not commodities. That is one reason why we have public goods, not public commodities. Anyway, the short point is that in order to have a functioning we have to have capabilities as well as requisite commodities or commodities as well as requisite capabilities. Thus only synchronous development of capabilities and commodities ensures human functioning.

However, synchronous development does not mean equal growth because capabilities as part of the being are stocks and many of commodities may be flows. No doubt some of the commodities are durable and services flow from them as 'something' flows from the capability stock. Further, as we are using here an individualistic perspective, it becomes necessary that importance of capability aids—outside the persona—is duly recognized.

One can notice I have given all examples of things one like for doing for its own sake. I have neither included the examples of beings nor those of doings related with production.

Sen had a distinction between being well and being well-off. Being well may allow to do many things which one enjoys doing while being well-off may not.

Further, it should be noted that the UNDP could not withstand the criticism made of its development paradigm. They started telling about instrument value of human development. For example, the third Human Development Report (UNDP, 1992) wrote:

Human development emphasizes investment in people—in basic health and nutrition, which is a form of investment, not just a means of distributing income as some people think. Healthy and educated people can, through productive employment, contribute to economic growth. Human development (developed humans) contributes to growth, and growth contributes to human well-being'.

Investment in development of humans and its returns in terms of growth is what human resource development is. The UNDP (1990) asserted that human development is different from human resource development, which the UNDP (1992) partially repudiates. Our great scholars kept quiet. In fact, education for leisure is not the same as education for work; education for curious mind is not the same as education for application of scientific principles. They are not the same though they may have something in common but the two are to be looked from different perspective. Reading Geeta (or a thriller) or listening to Rahman's (or Daler Mehendi) music or enjoying Anjolie's painting (or paintings in Bheem Baithaka) or watching sky may be different than reading economics, producing this report or performing an operation or putting a polar satellite in orbit.

Now, it is important that a few caveats are mentioned. Stealing is also a capability; so is also robbery or pick-pocketing. There are also people valuing them. Killing is also a skill, a capability. Are these capabilities part of human development? Certainly not. Well-being of a person not consistent with well-being of co-habitants may not well go down with the people who are entrusted with the task of valuation. Even the national income

statistician excluded some of the activities some people undertake. But the set of excluded activities may itself change over time. For example, sex work is now part of the GDP estimates.

Further, easy availability of divorce is a freedom; it enlarges choice through legal environment. It is valued by people who seek it. But people by and large do not want it to be very easy.

Appendix: Human Development in Human Development Reports

Since 1990, the United Nations Development Program has been publishing, as we have earlier indicated, Human Development Report, which is now an annual feature. Basically built around development of human capabilities, the term Human Development has been given a number of expressions in these HDRs, which are not all very consistent, speaking in strictly logical sense. It will not be a bad idea to collect them. But before we do it, it will pay us to remember that treating Human Development as an approach to development, it has been contrasted with other approaches such as economic growth, human capital formation and human resource development, human welfare and basic needs approach. Besides, asserting that human development is about the people as if development was not about the people unless word human is added. Further, so close in many ways to confuse many of us, human resource development and human development are two completely opposite views and approaches to valuation of capabilities. Human development approach values capabilities related to health, nutrition, and basic education as ends in themselves. Human resource development approach assesses investment in human capital—including health, nutrition and education, again human development values them for people value for their intrinsic values.

We collect below the essential portions from each of the Reports.

HDR1990: Human Development is a process of enlarging people's choices. While choices are could be infinite and change over time, *three essential ones* are for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. Additional choices, highly valued by many people, range from political, economic and social freedom to opportunities for being creative and productive, and enjoying personal self-respect and guaranteed human rights. (Question: Are three essential ones really choices? Does it mean that people are allowed to choose between the three or people can choose between short life or long life, between no education, less education and more education, between no income, low income or high income?)

The term Human Development denotes both the *process* and the *level* of their achieved well-being. It helps to distinguish clearly between two sides of human development. One is the formation of human capabilities, such as health, education and skills. The other is the use that people make of their acquired capabilities for work/productive purposes or being active in cultural, social and political affairs or for just leisure. If the scales of human development do not finely balance the two sides, considerable human frustrations may result. Human Development brings together the production and distribution of commodities (on the one hand) and the expansion and use of human capabilities (on the other). (Question: Should it not mean that capabilities without commensurate commodities and commodities without commensurate capabilities are meaningless?)

People are the real wealth of a nation. (Question: If wealth is means, then does it not mean that people are means? Then, what is the end?)

HDR 1991: (A) The basic objective of Human Development is to enlarge the range of people's choices to make development more democratic and participatory. These choices should include access to income and employment opportunities, education and health, and a clean and safe physical environment. Each individual should have the opportunity to participate fully in community decisions and to enjoy human, economic and political freedoms.

Men, women and children must be the centre of attention—with development woven around people, not people around development. Moreover, development must be participatory, and for this, people must have the opportunity to invest in the development of their capabilities—in their health, education and training. They must also have opportunity to put their capabilities to use—to be fully involved in all aspects of life, to express freely and creatively.

It has to be development *of* people, *by* people, *for* people.

Development of the people—every society must invest in education, health, nutrition and social well-being of its people, so that they can play their full role in the country's economic, political and social life. With more emphasis now being placed on the market and on technological progress, the development *of* the people will make an increasingly critical contribution to economic success.

Development by the people—through appropriate structures of decision making, people must fully participate fully in the planning and implementation of development strategies. These strategies should provide sufficient opportunities for income and employment growth, so that human capabilities are properly used and human creativity is given fullest expression.

Development for the people—development must satisfy everyone's needs, and provide economic opportunities for all. Only then will it be truly human-oriented. This would also include providing essential social safety nets.

Thus, it is that development increases people's choices-- with two caveats. First, enhancing the choices of one individual, or one section of the society, should not restrict the choices of another (Pareto?). This calls for equity in human relationship. Second, improving the lives of the present generation should not mortgage the choices of future generations—that is, the development process must be sustainable.

(B) Human development requires economic growth—for without it, no sustained improvement in well-being is possible. But while growth is necessary, it is not enough. High growth rates do not automatically translate into higher levels of human development. And firm policy action is required to forge a closer link between economic growth and human development.

Just as economic growth is necessary for human development, human development is critical to economic growth. This two-way link must be at the heart of any enlightened policy action.

Human development is moving to centre stage in 1990s. For too long, the question has been: how much is a nation producing? Now the question must be: how are its people fairing?

The real objective of development is to increase people's development choices. Income is one aspect of these choices—and an extremely important one—but it is not the sum total of human existence. Health, education, a good physical environment and freedom—to name a few other components of well-being—may be just as important.

A realistic view is that growth in income and an expansion of economic opportunities are necessary preconditions of human development. Without growth, the social agenda cannot be carried out. Although growth is not the end of development, the absence of growth often is. But growth should not be merely some aggregate number projected into the future, for the quality of growth is important. The aim should be growth that is:

- Participatory: allowing for private initiative and broad-based people's involvement.
- Distributed well: benefiting all people
- Sustainable: since raising future production may demand current sacrifices.

HDR 1992: (Human Development Report has written in response to the criticism leveled against it.) Human development emphasizes investment in people—in basic health and nutrition, which is a form of investment, not just a means of distributing income as some people think. Healthy and educated people can, through productive employment, contribute to economic growth. Human development (developed humans) contributes to growth, and growth contributes to human well-being. (Observation: HDR could not stand by HD and shifted to its HRD shades.)

True it stresses the need to develop human capability, it is equally concerned how these capabilities are *used*—by people who can participate freely in social, political, and economic decision-making and who can work productively and creatively for development. (Observation: development of what?)

It is not for basic needs alone, nor for poor countries. It applies to all countries. People everywhere has have needs and aspirations—though these naturally vary from country to country. Human development spans the full range of human needs and ambition.

Human Development concerns all activities—from production processes, to institutional changes, to policy dialogues. It is development focused on people and their well-being. People come first in its agenda. Human Development as a concept is broad and comprehensive.

It is as concerned with the generation of economic growth as with its distribution, as concerned with basic needs as with the spectrum of human aspirations, as concerned with the human distress of the North as with the human deprivation in the South. (Assimilative view rather than distinctive, which was given in the first Report.)

HDR 1993: Not crisply described in the report.

HDR 1994: Human beings are born with certain potential capabilities. The purpose of development is to create an environment in which all people can expand their capabilities, and opportunities can be enlarged for both present and future generations. The real foundation of human development is universalism in acknowledging life claims of everyone.

The paradigm of sustainable human development *values* human life for itself, not because people can produce material goods. (Observation: Slaves could also do it). It does not value one person's life more than another's. No new born child is of wrong class, or wrong country or wrong sex.

Development must enable all individuals to enlarge their human capabilities to the fullest and to put to the best use in all fields—economic, social, cultural and political.

Sustainability requires intra-generational equity and inter-generational equity, which is in terms of opportunities but not necessarily in terms of final achievements.

(Observation: Universalism and sustainability are emphasized. At the same time, a saving ground is created by asserting that equality of opportunity, not of achievements is enough.)

HDR 1995: Human Development is a process of enlarging people's choices. In principle, choices could be infinite and can change over time. But at all levels of development, three essential ones are for people to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. If these essential choices are not available, many other opportunities remain inaccessible.

But human development does not end here. Additional choices, highly valued by many people, range from political, economic and social freedom to opportunities for being creative and productive, and enjoying personal self-respect and guaranteed human rights.

Human Development thus has two sides. One is the formation of human capabilities, such as health, education and skills. The other is the use that people make of their acquired capabilities for work/productive purposes or being active in cultural, social and political affairs or for just leisure. If the scales of human development do not finely balance the two sides, considerable human frustrations may result.

Human Development brings together the production and distribution of commodities (on the one hand) and the expansion and use of human capabilities (on the other).

(So far, repetition of HDR 1997:1)

Four major elements:

Productivity: People must be enabled to increase their productivity and to participate fully in the process of income generation and remunerative employment. Economic growth is therefore a subset of human development models.

Equity: People must have access to economic and political opportunities. All barriers to economic and political opportunities must be eliminated so that people can participate in, and benefit from, these opportunities.

Sustainability: Access to opportunities must be ensured not only for present generations but for future generations as well. All forms of capital—physical, human and environmental—should be replenished. Capacity, environment and institutions.

Empowerment: Development must be by people, not only for them. People must participate fully in the decisions and processes that shape their lives.

HDR 1996: From human development perspective, economic growth is not an end in itself. It is a means to an end—enlarging people's choices. So, it should be evaluated for its impact on people.

HDR 1997: The process of widening people's choices and the level of well-being they achieve are at the core of the notion of human development. Such choices are neither finite nor static. But regardless of the level of development, the three essential choices for people are to lead a long and healthy life, to acquire knowledge and to have access to resources needed for a decent standard of living. Human development does not there. Other choices, highly valued by many people, range from political, economic, social freedom to opportunities for being creative and productive and enjoying self-respect and guaranteed human rights. Income is only one option that people would like to have, though an important one. But it not the sum total of their lives. Income is also a means, with human development the end.

(Observation: Confusion confounded. Income is an option?)

HDR 1998: Human Development is a process of enlarging people's choices. Enlarging people's choices is achieved by expanding human capabilities and functionings. At all levels of development the three essential capabilities for human development are for people to lead long and healthy lives, to be knowledgeable and to have access to the resources needed for a decent standard of living. If these basic capabilities are not achieved, many choices are simply not available and many opportunities remain inaccessible. But the realm of development goes further: essential areas of choice, highly valued by people, range from political, economic and social opportunities for being creative and productive to enjoying self-respect, empowerment and a sense of belonging to a community.

(Observation: Word choices is replaced by capabilities; good.)

HDR 1999: The role of care in the formation of human capabilities and in human development is fundamental. Without genuine care and nurturing, children cannot develop capabilities, and adults have a hard time maintaining or expanding theirs. But, important to note is that the supply of care is not an input into human development. It is also an output, an intangible yet essential capability—a factor of human well-being (p.77)

HDR 2000: Human Development is the process of enlarging people's choices, by expanding human functionings and capabilities. Human development thus also reflects human outcomes in these functionings and capabilities. It represents a process as well as an end.

At all the levels of development the three essential capabilities are for people to lead a long and healthy life, to be knowledgeable and to have access to the resources needed for a decent standard of living. But the realm of development extends further: other areas of choice highly valued by people include participation, security, sustainability, guaranteed

human rights—all needed for being creative and productive and for enjoying self-respect, empowerment and a sense of belonging to a community. In the ultimate analysis human development is development of the people, for the people and by the people.

The functionings of a person refer to the valuable things that the person can do or be (such as being well-nourished, living long and taking part in the life of a community). The capability of a person stands for the different combinations of functionings the person can achieve. Capabilities thus reflect the freedom to achieve functionings. In that sense, human development is freedom.

The basic idea of human development—that enriching the lives and freedoms of ordinary people is fundamental—has much in common with the concerns expressed by declarations of human rights.

(Observation: Slowly in human development the idea of capability is changing into that of freedom as Amartya Sen is changing perspective of development.)

HDR 2001: Human Development is about creating an environment in which people can develop their full potential and lead productive and creative lives in accord with their needs and interest. (People are the real wealth of the nations.) Development is thus about expanding choices people have to lead lives that they value. It is thus much more than economic growth, which is only a means—if a very important one—of enlarging people's choices. Fundamental to enlarging choices is building human capabilities—the range of things that people can do or be in life. The most basic capabilities for human development are to lead a long and healthy lives, to be knowledgeable, to have access to resources needed for a decent standard of living and to be able to participate in the life of the

community. Without these, many choices are simply not available, and many opportunities in life remain inaccessible.

Human development shares its vision with human rights. The goal is human freedom. And in pursuing capabilities and realizing rights, this freedom is vital. People must be free to exercise their choices and to participate in decision-making that affects their lives. Human development and human rights are mutually reinforcing, helping to secure the well-being and dignity of all people, building self-respect and the respect of others.

HDR 2002: Human development is about people, about expanding their choices to lead lives they value. Economic growth, increased international trade and investment, technological advance—all are very important. But they are means, not ends. Whether they contribute to human development in the 21st century will depend on whether they expand people's choices, whether they help create an environment for people to develop their full potential and lead productive, creative lives.

Fundamental to enlarging choices is building human capabilities—the range of things that people can do or be in life. The most basic capabilities for human development are to lead a long and healthy lives, to be educated, to have access to resources needed for a decent standard of living and to be able to participate in the life of one's community. Assuring people's dignity requires that they be free—and able—to participate in the formation of the rules and institutions that govern them.

WELL-BEING AND ITS CONSTITUENTS

Introduction

Welfare economics ignored capability dimension of development and development economics did not pay sufficient attention. It has been made somewhat good in the recent years. Though certain terms will be further explained, we can assert the contrast between opulence of people and their well-being in the following terms: Well-being is over the functioning space while opulence is on the commodity space.

Of late, it is the word well-being rather than welfare that is used in the economics literature, particularly that is concerned with development. Once for all, it appears, Sen has succeeded in impressing upon that being well (well-being) is the same as being well off. If someone is fabulously rich in terms of his possessions but poor in health could scarcely be called being well while he is exceedingly well off. From being well off to being well is tedious journey. Let us follow it.

The primary specification of a person's well-being is in terms of functioning vector. It can be converted into a scalar measure of well-being only through a real-valued 'valuation function' $v(\cdot)$ which maps functioning vectors into numerical representations. This valuation may not even be complete. But most difficult part would be judging social states through (i) involving comparison and (2) involving preferences of different people. Let us start from the well-being of an individual

Well-being of an Individual

Let X be the set of commodity vectors x over which the individual i has command over. It is his set of entitlement. He can choose any one of these vectors. The situation can be likened with the income line in consumer theory, which shows a number of commodity bundles that the consumer can buy. Thus, $x \in X$. Commodity command is a means of well-being.

Let F be the set of personal utilization functions $f(\cdot)$, which is a characteristic set of personal features of the being of individual i that he can utilize to achieve a set of functionings from x chosen from the set of his entitlements. This $f(\cdot)$ has to be conceived in the terms of a matrix if a vector has to be converted into another vector.

A functioning is an achievement of the individual through choice of $f(\cdot)$ and x . Let ϕ be a vector of such achieved functionings—beings and doings. This is obviously obtained from a choice of x and $f(\cdot)$. Therefore, $\phi = f(x)$.

It may be noted that Sen has mediated the matter of getting ϕ through characteristic vector y from commodity vector x . This conversion function, usually a matrix, has nothing to do with the individual i , while all other vectors and matrices are associated with the individual i . Bringing y into picture is not strictly necessary for it is x , which has to be selected in the exercise though selection of x depends definitely on the characteristics of commodities.

For a given commodity vector x , functioning vectors feasible for the individual i has naturally to be given by

$$P(x) = [\phi / \phi = f(x), \text{ for some } f(\cdot) \in F]$$

Obviously, P is a set of ϕ varying in accordance with choice about $f(\cdot)$. For the set of commodity vectors X , therefore, the functionings vector feasible for the individual i would be given by

$$Q(x) = [\phi/\phi = f(x), \text{ for some } f(\cdot) \in F, \text{ and for some } x \in X].$$

Obviously, Q is a set of ϕ varying in accordance with choice about $f(\cdot)$ and x .

$Q(x)$ represents the freedom that the individual i has in terms of choice of functionings through choice of using personal utilization functions $f(\cdot)$ and of selecting commodity bundle x . Naturally, the individual is selecting $f(\cdot)$ from the set of his personal features F and x from his entitlements which is his command over commodities.

Well-being can then be understood as a valuation of ϕ , indicating the kind of being he or she is achieving. (Sen, 1984, p.8). In case, ϕ s can be ranked completely, then a scalar values can be attached. If values v can be attached to ϕ , which means $v = v(\phi)$, then the values of well-being that the individual can attain will be given by the set

$$V = [v/v = v(\phi), \text{ for some } v(\phi) \text{ in } Q]$$

Human development is then concerned about expanding the limits of choice reflected in X and F .

FUNCTIONINGS

There is however need to focus on functionings. A functioning is an achievement of a person: what he/she manages to do or to be. It reflects, as it were, a part of the state of that person (ibid, p.7, lines5-6). A functioning is neither a commodity, nor having it, nor having utility from it. A functioning refers to a doing or a being (ibid, p. 8). Functioning vector thus reflects a set of doings and beings (p.23)

Longevity and literacy in particular have received a good deal attention in the development literature. This relates functions to non-market observations of personal state. It is natural to make extensive use of non-market data, direct observations of conditions of persons, to understand the functionings that they achieve. It can be argued that this type of investigation can sensibly be extended to cover other conditions of persons which economics literature has been rather reluctant to examine, in particular morbidity and undernourishment, which relate to some important functionings that frequently fail badly in poor developing countries (ibid, p. 30).

Functionings involving longevity, nourishment, basic health, avoiding epidemics, and being literate may have less variation. There are others with great deal of variation even in rich countries. Functionings involving literacy, cultural and intellectual pursuits and vacationing and traveling have great deal of variation (ibid., pp.30-31).

The conversion of commodities (-characteristics) into personal achievement of functionings depends on a variety of factors—personal and social. For example, in the case of nutritional achievements, it depends on such factors as (1) metabolic rates, (2) body size, (3) age, (4) sex, (5) activity levels (6) medical (health) conditions, and (7) nutritional knowledge, and also on (8) climatic conditions and (9) access to medical services. First seven can be taken as personal features—the beings as part of the persona. The last two can be taken as part of environment/entitlement (both of which enable from outside). These make one choose f from F , which is only partly a matter of choice but there is scope. Age, sex, and height one cannot choose but one or his society can improve medical conditions and nutritional knowledge.

Capability

Since human development has been defined in terms of extending capabilities and enhancing functionings, it would do good to discuss the idea in some detail. We may recall that Q has been called by Sen as the capabilities of the individual i , given those parameters. To be more precise, Q is the capability set—a set of functioning n-tuples, each representing an alternative vector of functionings ϕ . It is thus but a combinations of functionings which the individual can achieve. It does not reflect the personal features of the individual, which are normally understood as one's beings. By slip, Sen (1987, p.10, line 6) has once referred to f as the vector of functionings, which it is not correct as per the definitions (ibid, p.7).

The totality of all the alternative functioning vectors the person can choose from, given by the contingent circumstances, is Q , that reflects the person's capabilities, i.e., the various alternative functioning bundles he or she can achieve through choice (ibid, p.18, lines 14-19). But Q obviously depends not only on capabilities, as ordinarily understood, but also on circumstances.

If a capability to do is understood as a personal feature, a being, then it is better to regard f as a capability vector, not ϕ , which operates on x to produce ϕ . Sen refers to bike as commodity, transportation as it characteristic, and bicycling as a functioning. Functioning of bicycling will depend on the fact whether the individual is able-bodied (and skilled in cycling) or crippled. Functioning ϕ thus depends on capability f and commodity x .

Aggregation of Functionings

Though the whole approach concentrates on the individual, numerical presentation has been made only an aggregate level. Aggregation of sets of potential functioning n-tuples of the individual constituting a community has not been attempted. Aggregation of

actual achieved functionings has however been attempted. Let us designate this set of achieved functionings of p individuals as A and represent it in the following manner:

$$A = \left[\begin{array}{c|c|c|c} \left. \begin{array}{c} a_{11} \\ a_{21} \\ \vdots \\ a_{j1} \\ \vdots \\ a_{n1} \end{array} \right\}_1 & \left. \begin{array}{c} a_{12} \\ a_{22} \\ \vdots \\ a_{j2} \\ \vdots \\ a_{n2} \end{array} \right\}_2 & \dots & \left. \begin{array}{c} a_{1k} \\ a_{2k} \\ \vdots \\ a_{jk} \\ \vdots \\ a_{nk} \end{array} \right\}_k & \dots & \left. \begin{array}{c} a_{1p} \\ a_{2p} \\ \vdots \\ a_{jp} \\ \vdots \\ a_{np} \end{array} \right\}_p \end{array} \right] = \left[\begin{array}{c} \{a_{11} \ a_{12} \ \dots \ a_{1k} \ \dots \ a_{1p}\} \\ \{a_{21} \ a_{22} \ \dots \ a_{2k} \ \dots \ a_{2p}\} \\ \{ \dots \} \\ \{a_{j1} \ a_{j2} \ \dots \ a_{jk} \ \dots \ a_{jp}\} \\ \{ \dots \} \\ \{a_{n1} \ a_{n2} \ \dots \ a_{nk} \ \dots \ a_{np}\} \end{array} \right]$$

All these elements have to be aggregated. But how do we do it? There could be two ways. One could be that we attempt aggregation of each individuals' vectors into their respective well-beings and then individuals' well-beings into society's well-being. This purports to converting each column vector into a scalar and thus first creating a row vector of p -size and then converting this column vector into a scalar number. The other could be that we attempt to aggregate a single being/doing of all individuals and then these aggregated beings/doings into society's well-being. This purports to converting each row vector into a scalar and thus first creating a column vector of n -size and then converting this column vector into a scalar number.

The Human Development Report has attempted the second course where health-beings of all individuals have been first converted into life-expectancy of the society and literacy capabilities of all individuals have been first converted into literacy level of the society. The same could be said about enrolment ratios but not so clearly about per capita GDP. Then, these societal components of functionings (beings and doings) are aggregated into Human Development Index in a linear fashion.

HUMAN DEVELOPMENT INDEX

Some Important Views

In a special contribution made by Amartya Sen (1999), in the tenth edition of the Human Development Report, shares the following lengthy piece of information:

... the HDI, which is inescapably a crude index, must not be seen as anything other than an introductory move in getting people interested in the rich collection of information that is present in the Human Development Report. Indeed, I must admit I did not initially see much merit in the HDI itself, which, as it happens, I was privileged to help devise. At first I had expressed to Mahbub ul Haq, the originator of the Human Development Report, considerable scepticism about trying to focus on a crude index of this kind, attempting to catch in one simple number a complex reality about human development and deprivation. In contrast to the coarse index of the HDI, the rest of the Human Development Report contains an extensive wealth of information on a variety of social, economic and political features that influence the nature and quality of human life. Why give prominence, it was natural to ask, to a crude summary index that could not begin to capture much of the rich information that makes the Human Development Report so engaging and important.

This crudeness had not escaped Mahbub at all. He did not resist the argument that the HDI could not be but a very limited indicator of development. But after some initial hesitation, Mahbub persuaded himself that the dominance of GNP (an overused and oversold index that he wanted to supplant) would not be broken by any set of tables. People should look at them respectfully, he argued, but when it came to using summary measure of development, they would still go back to the unadorned GNP, because it was crude but convenient. As I listened to Mahbub, I

heard an echo of T. S. Eliot's poem "Burnt Norton": "Human kind/ Cannot bear very much reality".

"We need a measure", Mahbub demanded, "of the same level of vulgarity as GNP—just another number—but a measure that is not as blind to social aspects of human lives as GNP is." Mahbub hoped that not only would the HDI be something of an improvement on—or at least a helpful supplement to—GNP, but also that it would serve to broaden public interest in the other variables that are plentifully analysed in the Human Development Report.

Mahbub got this exactly right, I have to admit, and I am very glad that we did not manage to deflect him from seeking a crude measure. By skillful use of the attracting power of the HDI, Mahbub got readers to take an involved interest in the larger class of systematic tables and detailed critical analyses presented in Human Development Report. The crude index spoke loud and clear and received intelligent attention and through the vehicle the complex reality contained in the rest of the Report also found an interested audience.

A little later, Sen (2000) said,

... its easy communicability and salience had made it a much used and appreciated indicator of parts of the complex process of human development.

However, Sakiko Fukuda-Parr, the present director of the Report does not quite share this view. He says:

Ironically, the human development approach to development has fallen victim to the success of its human development index (HDI). The HDI has reinforced the narrow, oversimplified interpretation of the human development concept as being only about expanding education, health, and decent living standards. This has obscured the broader, more complex concept of human development as the expansion of capabilities that widen people's choices to lead lives that they value.

Despite careful efforts to explain that the concept is broader than the measure, human development continues to be identified with the HDI—while political freedoms, participating in one's community and physical security are often overlooked. But such capabilities are as universal and fundamental as being able to read or enjoy good health. (PKC: what are those capabilities?) They are valued by all people—and without them, other choices are foreclosed. They are not included in the HDI because they are difficult to measure appropriately, not because they are any less important to human development.

Backgrounder

Human Development Index was first proposed in the Human Development Report 1990. It went on being revised by the UNDP on its own and in response to critical reviews made by the academia as well as policy makers. The UNDP (1993, p. 104) points out that even before the reviews began to appear, the process of revision was already under way in the UNDP. Some of the criticisms, made later, were already incorporated in the second version of the HDI in 1991 Report. Contributions of Sudhir Anand, Amartya Sen and Meghnad Desai are especially acknowledged. The UNDP (ibid.) had suggested that the HDI should be seen as evolving and improving, not something cast in stone. The UNDP also wanted it to be seen as an exercise in which as many of its users as possible should actively participate.

We see over years changes were brought in (i) proximate variables, particularly in the sphere of knowledge, (ii) changes in weights, (iii) changes in maximum and minimum values, (iv) transformation formula of income variable.

Concept of human development is broader than the measure of human development (UNDP, 1990, p.12; 1991, p. 15). It is suggested that Human Development Index be seen as a measure of people's ability to live a long and healthy life, to communicate and to

participate in the life of the community and to have sufficient resources to obtain a decent living. It is also said to be a minimal measure as it captures only a few dimensions of human development. The report of 1991 (UNDP, 1991, p.15) writes, 'The HDI concentrated on just three of the many and changing essential choices (?) that define human development. It is simple and reliable measure of socio-economic development'.

The index was conceived as an unweighted, or equi-weighted, average of relative achievements (the UNDP calls them distances) measured in longevity, education and resources. There is a clear asymmetry. Longevity and education are clearly valuable as aspects of a good life and also values as constituents of the capability to do other things while command over resources is only an instrument for other ends—indeed income is just one way of seeing this command. The first two are direct measures and the third one indirect (Anand and Sen, 2000, p.86). However, the proximate variables for these dimensions were chosen in 1990 Report to be:

- (i) life expectancy;
- (ii) adult literacy rate; and
- (iii) welfare generating capacity of (per capita) income.

The first changes were effected in the next report itself published in 1991 so that it could differentiate various developed countries where HDI had already reached close to one in its present formulation. As was pointed out by Paul Streeten, this approach addresses to the problems of rich countries as well. Therefore, one more variable was added. It was mean years of schooling. It was made a part of the dimension of education or knowledge along with adult literacy rate with one-third and two-thirds weights within the group. Strictly speaking there were four variables life expectancy, adult literacy rate, mean years

of schooling and welfare returns to income with weights $(1/3)$, $(2/9)$, $(1/9)$ and $(1/3)$. Two, the method of measuring welfare generating capacity of, or returns to, per capita income was changed from log transformation with a cap to piece-meal Atkinson formula for income ranges, each equal to the size of poverty line.

There were also introduced other changes, which we shall notice as we along.

Health And Long Life

Everybody wants to live indefinitely long life and with good health (if not feeling forlorn, and this is important). Good health is as important as long life; it is in itself a source of enjoyment; it is a basic requirement to make one able to participate in various social activities. Besides other impacts, morbidity dispirits living. If in serious morbid state, many people may ask for euthanasia; and if forlorn they may do likewise. When we move from individual to society as regard to quantity and quality of life people live, we encounter enormous difficulties.

If speaking about the health of a people, one has to use some summary statistics. Longevity can reasonably be measured by life expectancy at birth, which takes into consideration present mortality conditions of people at different ages (thus life expectancies at different ages). Imperfect as it is, this is the accepted, and most readily available, measure. Until a simple way of improving on life expectancy becomes available, the current life expectancy measure has to be used, argued the UNDP (1991, p.90). Life expectancy is therefore accepted as a reasonable proximate variable of longevity. It is said to be widely acceptable indicator of development (UNDP, 1993, p.105) and 'less misleading' as an average for its variance across individuals within a group/country is less than that of income. Does it mean that income is more misleading or they are all

misleading? Further, it can be noted that life expectancy is not the characteristic property of an individual as income can be. The use of life expectancy as one of the principal indicators of human development, asserts the HDR 1991 on three considerations:

- (i) The intrinsic value of longevity: Theorists may like to undermine its importance in the case of countries where it is already high as the challenge to make the lives of the old and infirm happy and worthwhile may be an exacting task. However, for the people in less fortunate world attach a high value to long life expectancy even though the life there is battered by distress, deprivation and fear of premature death.
- (ii) Helping people pursue various other goals: Besides living just long, people have many ambitions, aspirations and plans, the pursuance of which requires a reasonably long life so that they can develop abilities, use their talents and carry out their plans.
- (iii) Association with other characteristics, such as adequate nutrition, good health and education and other value achievements.

However, there is no reason that life expectancy should not be adjusted for morbidity. Two different groups of people (in the same place or in different places) may have same life expectancy at birth yet life expectancies across ages may be different. Both being the same, they may have different morbidity levels. However, except in a few Reports/works, such as one by the NCAER, the factor of morbidity is not included for analysis. Accepting that life expectancy is but a quantitative measure—and Sen has verily called it quantity of life, the quality of life is an issue that invites more attention that it has yet received (UNDP, 1993, p.105).

Social support and social relationships have positive impact on life expectancy while cigarette smoking, hypertension and lack of physical exercise. Married adults enjoy lower risks of mortality than those who are unmarried.

Infant mortality rate and child mortality rate are considered specifically bad indicators of health. While they are given as indicators in the health profile/child survival/human deprivation, they are rarely made part in any version of the HDI. In Human Development Report Maharashtra 2002, infant mortality rate has been used in place of life expectancy at birth because life expectancy at district level was not available—not because of its intrinsic value.

It may be recalled that Morris D. Morris had used infant mortality rate in conjunction with life expectancy at age 1 in his physical quality of life index (PQLI) with equal weights. Further, the Planning Commission (2002) has used both life expectancy and infant mortality rate with 0.65 and 0.35 as weights.

According to the UNDP (1993, p.105), Pyatt has argued for non-inclusion of infant mortality in view of the fact that life expectancy is explained by income and infant mortality. When income is already included in the index, infant mortality gives extra information. However, a suggestion made by Desai (1989) for using potential lifetime (PLT), which can be calculated for persons of a group (most probably cohort) in terms of conditional expectation of remaining lifetime, is not found suitable by the UNDP (1993, p.105) for inter-country comparison. It is however found to have a 'natalist bias' to favour countries with growing populations and moderate life expectancy.

Besides, the child mortality rate, death rate, and maternal mortality rate are also suggested as measures related with this dimension. Some people (for example NCAER)

wish to include among indicators birth rate as well, without offering any justification. Though the UNDP report includes the total fertility rate among demographic variables, it does not attach any importance in the writing.

Let it finally be noted that life expectancy is a stock variable, a group trait rather than an individual trait, and an average measure. Data on the life expectancy for different countries is provided by the UN Population Division to the UNDP.

(Note1: According to the WHO, health does not refer to absence of illness but physical, material, and spiritual well-being. But such an approach is hardly operational. Luckily so far the WHO is working within operational confines.)

Educational Achievement

In the course of living people do acquire knowledge but they wish, given the opportunity, to acquire more of it. Knowledge can be classified with ease in two groups: secular and spiritual. Secular knowledge may itself be related to skills or be scholastic. Cultivation, carpentry, blacksmithy, goldsmithy, and pottery or business skills or music or medicine are all secular, mundane and were traditionally handed down from generation to generation in all cultures. Literature, history, philosophy and mathematics fall in the scholastic category and were to be acquired through some formal channel. Today, knowledge through literacy has assumed great importance.

The Report for 1990 used only adult literacy rate, that is, the percentage of literates in the population 15+, as a proximate variable for knowledge (level) of a people. In the next Report in 1991, the UNDP included another variable extent of schooling a people have received. This was measured as the mean years of schooling for individuals over 25 years of age. Thus, persons with age 25+ are counted twice. Further, the data refers to the year 1980 and therefore do not capture recent changes (UNDP, 1991, p.90).

The argument was that adult literacy rate failed to discriminate among countries near the top of the ladder, particularly the industrial countries (UNDP, 1991, p.15). We will understand by this argument that all of them, in fact the top twenty, had reached the top plateau of 99 percent adult literacy rate. However, this is not the case. We are informed that these industrial countries often failed to report this statistics to the UNESCO wherefrom the UNDP lifts educational statistics and it was this reason, says the UNDP (1993, p.106) that mean years of schooling was added to adult literacy. Knowledge came to measured by two educational stock variables (ibid, 100). The UNDP therefore changed the nomenclature of dimension from knowledge to educational attainment. It rejected the suggestion (made by Irmgard Nubler, 1991) to incorporate vocational education, on-the-job-training and non-traditional modes of acquiring education with the argument that some of these variables relate more to human capital formation and thus to income generation rather than human development as such (UNDP, 1993, p.106). It is a logical argument.

While the UNDP (1993, p.106) agreed that life expectancy and educational attainment are both *stock* variable and change rather slowly but did not agree at that stage to incorporate school enrolment or university enrolment, which would capture recent educational advance better than the variables in use then. People (like Peter Smith, 1992) making this suggestion argued that, in many developing countries, a substantial portion of the growing population is under 18, and often majority is under 25 and the measure that relate to adults or those over 25 cannot capture the *flow* of educational attainment being achieved. But the UNDP thought at that point of time that this argument leads to using different indicators for the developing countries than that for the industrial countries and therefore found the argument less plausible for a universal HDI. It seems it forgot its

argument for favouring indicator of mean years of schooling against that of enrolment ratio. It behooves of the UNDP that they admit that earlier argument was flawed or did not hold any longer, which they hardly ever do.

Niels Lind (1991) is reported to have argued that literacy is difficult to measure and it takes different amounts of effort to achieve it in different languages— languages written ideographic scripts such as Chinese and Japanese take more time. The defence put up for this by the UNDP was two-fold. One, the definition of literacy is country-specific and each culture appreciates the effort expended to acquire literacy. This issue would have mattered only, they argued, if a universal definition were applied. This is a surprising argument as the HDI construction is said to be universal and a universal measure must try for universal definitions. Further, they had argued, functional literacy is much lower than recorded literacy, especially in industrial countries, which often claim an impossibly high 99 per cent rate. (The upshot of the second part of the defence is hanging afire.) Two, as literacy is no longer the sole indicator of educational attainment, there is some correction to these biases.

Any index maker would agree that an indicator, which is to be used for comparison purpose must have the same definition across units. The UNDP index is weak in this respect.

But more importantly, one may recall the argument by the UNDP (1993, p.106) that the industrial countries often failed to report statistics related to adult literacy rate to the UNESCO (wherefrom the UNDP lifts educational statistics) and therefore the variable of mean years of schooling was added to adult literacy. The UNDP however chose to replace mean years of schooling by combined enrolment ratio. The argument now is that 'the formula for calculating mean years of schooling is complex and has enormous data

requirement (UNDP, 1995, p. 19). They say this data is also provided by the UNESCO. 'The combined enrolment ratio ... shows the stock of literacy or those under 24', said the UNDP (ibid). We think enrolment ratio is a flow as enrolment is a flow pertaining to an academic year, which is divided by the mid-year population stock to yield the enrolment ratio.

Access To Resources For Decent Living

According to Anand and Sen (2000, p.86), the use of command over resources in the HDI is strictly as a residual catch-all, to reflect something of other basic capabilities not already incorporated in the measures of longevity and education. They suggest that the command over resources could not have served as proxy for health and longevity or education. But does the command over resources exclude the capabilities related to health and education altogether?

For this long phrase of the dimension, whatever it may mean, income is the proximate variable and Anand and Sen (2000, p.86) hold that income just one way of seeing this command. Scarcity of data on access to land, credit, income and other resources, the UNDP (1990, p.13) argued, 'we must *for the time being* make the best use of an income indicator. Note word 'income' on both the sides! Can a household with a very low income afford to have decent living? How do we know that a household with sufficient/large income, in some sense, will have a decent living? What do we mean by decent? Is decency defined locally or universally? Let us leave this issue and accept that level of living (decent or indecent) is in some way associated with income.

Income is a means, pointed out by the UNDP time and again, not an end. It is accepted as proxy to capture the dimensions of human development, which have been left

out from explicit enumeration. But at the same time we should be able to note that it is so treated that it appears in the end as an end; otherwise the HDI would be become an amalgam index of means and ends. Here the UNDP (and Sen) are confused as income does not appear as such but in a converted form. This transform of income, it has been asserted, connotes well-being returns, contribution to human development, capabilities enhancement and achievement of functionings. It is better to call it well-being returns of income rather than command over resources.

As against the other two dimensions, captured through stock variables—one partly supplemented by a flow variable, this one is captured through a flow variable income. This component was most discussed. In fact, this is the variable that was subjected to repeated revisions but never supplemented by anything else except in side exercises. The data on this provided by the World Bank to the UNDP.

Before we take up this dimension in depth, we should consider whether this dimension should at all be considered or what weight it should be assigned. With the argument that income covers the two other dimensions (and therefore it can be the sole indicator) as these variables are empirically so highly correlated that they are rendered redundant, the UNDP (1993, p.107) is in disagreement and quotes at length from Anand and Sen (1992) on conceptual difference between human development and human capital formation/ human resource development, which has little relevance with the counter-observation made. With regard to suggestion for replacement of income variable by consumption variable, the UNDP simply ignores.

Income is reckoned with real per capita GDP in purchasing power parity dollars. This is done with a view to ensuring both inter-temporal and inter-country comparability.

Measurement in terms of purchasing power parity dollars neutralizes differences in relative size of tradable (across borders) and non-tradable sectors and possible overvaluation of exchange rates (UNDP, 1990, p.12).

The UNDP (1990, p.12) further suggests that the indicator—per capita income—should reflect the diminishing returns to transforming income into human capabilities.

Application of principle of the marginal diminishing utility of consumption of a good tells us that a person, when his consumption doubles, will not feel twice better in terms of utility but less. Replacing a good by income (which is in some sense a weighted good) and utility by well-being or welfare, one can safely say there exists some kind of a principle of diminishing marginal well-being returns to income. Income is input and well-being is the outcome. Converting this intra-personal experience into inter-personal experience, one could attempt to say that a rich (very well-off) person enjoys more well-being than a pauper (less well-off) but not in proportion to the difference in income. We may well remind ourselves of the limitations of such comparisons. Making further allowance, a country with more per capita income will have higher level of well-being than a country with less per capita income but the well-being of the former will be less than proportionately higher than that of the latter. Never mind the jump from consumption of a good to income (including public component), the jump from intra-person comparison to inter-person comparison to inter-country comparison and, of course, the jump from utility to well-being. Theoreticians may not be very happy with so many jumps. But who cares!

Holding it to be the most difficult to measure simply, the Report of 1990 (UNDP, 1990, p.12) held that indicator should reflect the diminishing returns to transforming income into human capabilities as people do not need excessive financial resources to

ensure a decent living. This aspect was taken into account by using logarithm of real GDP per capita for income indicator (ibid.). As in case of intra-personal experience, it is understood that there exists a level of satiety, which is that the consumption of the good beyond that level does not add any utility; it can indeed decrease. In case of income, satiety is usually not accepted. But the UNDP further decided that there should be a cap on income beyond which we should believe that an increase in income does not lead to any increase in well-being (which means that the satiety reaches!). The cap was placed at the average of the official poverty lines (level is the word used, UNDP, 1991, p.89; 1993, p.107), converted to PPP\$, of nine industrial countries (Australia, Canada, the Federal Republic of Germany, the Netherlands, Norway, Sweden, Switzerland, the UK and the US) (UNDP, 1990, p.13). The justification for the design of the second element was said to be the emphasis that the Human Development Report places on poverty alleviation.

The UNDP finds the logarithmic transformation to be analytically appropriate but thinks it is necessarily arbitrary. However, combined with a poverty cap, the formulation, in its reckoning provides greater weight to literacy and longevity than to income (UNDP, 1990, p. 15). However, the cap does not matter and removing it will have little effect on relative ranking among the rich countries and no impact on the poor countries. Using average per capita GDP of industrial countries (PPP\$12952) instead of UNDP cap (PPP\$ 4861), Allen Kelly (1991) has concluded that the HDI does not appear to be particularly sensitive to the poverty line cut-off. It is difficult to believe, he says, that such a large increase in income per capita would have only a small impact on 'enlarging people's choices'. We can see that 150 percent increase in absolute number results into 10 percent increase in the logarithmic transform.

Allen Kelly (1991) has also questioned this wisdom as he finds that there is plausibly diminishing marginal utility to health and education as well. We do hear old people telling/asking what shall they do living long. In many cultures, young people feel so about long life of those who have played their innings of productive life. And, after at stage we all stop getting formal education. Then why not such a treatment to the other two dimensions.

Logarithmic transformation (without cap) commanded much support from scholars such as McGillivray (1991) and McGillivray and White (1992). In fact, in 1991 Report, the UNDP itself had explored many alternatives and had reached the same conclusion.

The UNDP (1991, p.89) says that the logarithmic transform with assumes a sharply diminishing marginal contribution of income to human development and the cap on it asserts that any income above poverty line should get zero weight. In three exercises carried out by it, the UNDP finds that by removing the cap, the result show that rank correlation is 0.997, keeping the cap and dropping the log transformation, the rank correlation is 0.994, and doing both also gives the rank correlation equal to 0.994. Variations explored thus did not the ranking except in a few cases. It simply means that when the variable is normalized for turning into indicator it does not make much difference whether it is transformed or not. However, in the second Report in 1991, the logarithmic transform was dropped and a new formulation was adopted. This formulation continued for long eight years.

The principle of diminishing marginal utility was introduced through another route. Holding that in the variations explored above, one has full weight for income below the poverty line and nil above it and in the other all income has the same (and full) weight. So,

have fractional weights. In an exploratory exercise the UNDP (1991, p.89) tried a two-term piecemeal Atkinson formulation in which the parameter receives value zero for the first term and value $\frac{1}{2}$ for the second term.

In 1991 report the UNDP (1991, p.90) holds that a more systematic (in comparison to what was done in 1990) way to use an explicit formulation for the diminishing returns. The parameter in Atkinson formulation for the utility of income suggests the extent of diminishing returns.

First, income up to the poverty line level was not discounted at all; it was assumed that increase in income in this range proportionately enhances well-being and extends choice. Second, in the reckoning of the UNDP (1993, p. 107) a progressively severe correction for diminishing marginal utility was introduced through the use of a modified version of Atkinson formula. There is a parameter in Atkinson formula, signifying the elasticity of marginal utility with respect to income, called inequality aversion parameter or risk aversion parameter in other contexts. The whole income span is divided in ranges each in length equal to the poverty line income. A different level of the parameter is fixed for different ranges of income. For the income in the range of one-poverty-line level and two-poverty-line level, it is fixed one-half; for the income in the range of two-poverty-line level and three-poverty-line level, it is fixed two-thirds; for the income in the range of three-poverty-line level and four-poverty-line level, it is fixed three-fourths; for the income in the range of four-poverty-line level and five-poverty-line level, it is fixed four-fifths; and so on for subsequent ranges. An income will lie in one of these ranges.

For an income in the n-th range, this scheme leads to an addition to the basic poverty-line income level, of twice of its square root (for the second range), thrice of its

cube root (for the third range), quadruple of its fourth root (for the fourth range), and finally n-th root of the difference between the level of income and (n-1) times the poverty line (and this difference is less than the amount of poverty line).

This pattern is neat though the formulation to many people is complicated. This formulation, according to the UNDP (1993, p.), replaces a constant (marginal utility) elasticity function (with elasticity equal to unity) by a variable (marginal utility) elasticity function, with respect to income. However, it is basically flawed.

Harold Trabold-Nubler (1991, p. 240) finds quite a few problems in this formulation. One, its functional form generates an anomaly at the boundary points; an extra dollar has a much higher marginal utility just above a multiple of the poverty line than just below it. Thus, just above the poverty line income (UNDP writes 'twice the poverty level'), a dollar has marginal utility of two. This 'first dollar' anomaly, as he calls it, does not however create 'spikes' in final results, perhaps the actual incomes are not close enough to the multiples of the poverty line. Two, this transformation also reduces the significance of extra income above poverty line as severely as the logarithmic transformation. Thus, absolute difference of PPP\$15230 between average incomes of the USA and Brazil become just PPP\$450, just three percent, after transformation. Third, not given in by the UNDP (1993, pp.104-114) in its survey of recent reviews, what appears to be a local anomaly turns out to be a global one in the ninth range for the present level of poverty line. Fourth each range as a whole contributes for than the previous range.

The UNDP (1993, p.107) defends differential treatment given to income above and below poverty line. Poverty line can be taken as minimal cost for providing wherewithal to withstand vicissitudes (essential choices by the UNDP), it is difficult to argue that increase

in income within the range below poverty line is somewhat less effective in enhancing well-being. On the contrary, it has been argued, that until a minimum income is reached, it is inappropriate to speak of utility in the sense of positive satisfaction derived from income or consumption expenditure. It is consistent with theory of linear expenditure system in which utility is not considered calculable unless consumption crosses a certain minimum. Meghnad Desai (1990) takes a view that only extra consumption beyond subsistence yields any utility. It is also consistent with Pyatt's division of income between affluence and basic income. But these assertions are not answers to the question raised by Trabold-Nubler (1991).

It may be noted that Paritosh Banerji (1996) had independently discovered the Trabold-Nubler anomaly through an empirical exercise. Chaubey (1998) also discovered it independently and also provided the mathematics for the anomaly. [However, he came to know about the contribution of Banerjee before publication of his paper.] Bhatnagar (2000) extended the result given by Chaubey (1998) through the method of mathematical induction. It could then be seen that the local problem, observed by Trabold-Nubler (1991), had to explode into a global problem that he had noticed first. These problems will be dealt with in a separate chapter.

Weighting Pattern

The UNDP says it has accorded equal weight to three dimensions. Since any choice of weights could have been equally arbitrary, the UNDP proposed to assign them equal weights. If we consider all four variables as separate dimensions then we find that all weights are not equal. Further, these weights are assigned when variables are transformed

into unit-less entities with values between 0 and 1. Therefore these weights are not weights to original values of various variables.

Allen Kelly (1991) feels income has much larger importance and should have been accorded to a larger weight as it reflects wider choices as in some countries people may enhance their capabilities through health and education and in others may elect to such choices as do not reflect improvement in health or education.

If a meta production function of human development could be specified, then weight of component variable would be equal to its contribution to human development. Lacking such a meta production function, investigators are left to explore the pattern of correlation among variables. Husseyin Tatlidil (1992) carried out a principal component analysis on the data from the HDR 1992. He found simple correlation between life expectancy and educational attainment, between life expectancy and adjusted income, and between educational attainment and adjusted income to be 0.0.87, 0.85 and 0.73. There is indeed a very high degree of commonality. The first principal component explains as much as 88 percent of the total variation. Factor loadings for the first principal component are however found to be 0.97 for life expectancy, 0.93 for educational attainment and 0.92 for adjusted income. Thus the weights are virtually equal. This is the defence by the UNDP.

Income is notoriously unequally distributed, holds the UNDP (1993, p.106), but (its arithmetic difference) is nevertheless a misleading indicator of differences in well-being between people and households. The purpose of this observation is not spelt out. However, holding that average income conceals the level of inequality in the distribution of resources in the society, a few years in beginning the UNDP carried out exercises which used distribution adjusted per capita income a la Amartya Sen who formalised the basic

idea of Pigou (1952) that welfare depends on the size of the cake and the distribution among the people.

Maximum And Minimum Values

For many purposes, comparison and aggregation being important, the variables have to be standardized. In the UNDP methodology, to begin with, standardization was effected through what has been called range equilisation method. In this method, the distributions of three variables, taken as independent, are considered. For each of distribution actual achievement of a country for a given variable was subtracted from the maximum value (not, from the mean). This gave absolute deprivation. This absolute deprivation was divided by the range of income (not, by the standard deviation) of the variable across countries. This gave the standardized value, confined in the interval of 0 and 1, both inclusive. Then, these standardized values for a country were averaged to yield the average deprivation of a country. Human development achievement level of that country was obtained by subtracting this average deprivation from 1. Later, the achievement level was directly obtained. In all these operations the maximum and minimum values were chosen from the distributions of respective variables across countries for a given year, and that was the year of exercise.

It may be noted that there was an exception. In the case of income variable, it was considered that beyond a certain level, income was considered not to be yielding any additional well-being. It means income distribution was truncated. This truncated value could be called desirable value. But it was rated as maximum desirable, not minimum desirable. In other cases, naturally maximum values were desirable values too. So, in place of maximum, word desirable was used in the beginning. But the definition of range

demands it to be the maximum. Since income distribution was truncated at some point, it causes no problem.

Next year, the UNDP wanted to do not only inter-country comparison but also inter-temporal comparison of countries, they introduced what they called modified human development index (MHDI), in which the maximum and minimum values were chosen from the history of countries between 1960-1990. Noting that the future events could change maximum and minimum values, it was decided that they are extraneously fixed. For life expectancy they chose 25 years and 85 years as the minimum and maximum (later changing to 27.5 years and 87.5 years for female and 22.5 years and 82.5 years for male but keeping the change at 60 years) and for literacy rate and combined enrolment ratio they chose 0 and 1 as the minimum and maximum. For income variable they fixed PPP\$200 as the minimum (later to be revised to PPP\$100 for the female) and PPP\$40000 as the maximum attainable in any foreseeable future.

It should however be noted that so long as each component is under study, the choice of maximum and minimum values does not matter in ranking the units. But once these components are to be aggregated, their choice becomes crucial. For example, if instead of PPP\$40000, PPP\$60000 is chosen as the maximum per capita income, the whole distribution will become 2/3rds. The values of HDI of all the countries would be low. But the HDI of those countries, which could show up better HDI because of their per capita income and therefore better ranks, would now be found to be having lower ranks in HDI. There may be good reason to choose a higher figure as the maximum per capita income. Kuwait and Luxembourg have been found to cross the maximum mark of PPP\$40,000. Further, if the analysis has to be conducted for sub-units of the nations, many would be

found to have exceeded the maximum limit and few may be found to be below the minimum.

See Tables 1, 2 and 3. While Table 1 present the maximum and minimum values of the life expectancy at birth as chosen in different HDRs, the Table 2 presents components of educational attainments along with their maximum and minimum values. Table 3 is somewhat peculiar. It presents maximum and minimum values of income as well as their values in terms of welfare returns, as formulated from time to time. In this component there was an additional requirement in certain formulations, which related to the threshold.

It may be recalled that the basis for choice of the maximum, minimum and threshold values has been changing in all these years. Therefore, in these tables, the basis of selection has also been indicated.

TABLE 1
LIFE EXPECTANCY AT BIRTH IN YEARS IN UNDP's HDRs 1990-2002

Report Years	Maximum	Minimum	Range	Basis
HDI				
1990	78.4	41.8	36.6	Current Year
1991-93	78.6	42.0	36.6	Recent Past
1994-02				
Person	85.0	25.0	60.0	Norms
Male	82.5	22.5	60.0	Norms
Female	87.5	27.5	60.0	Norms

TABLE 2
COMPONENTS OF EDUCATION ATTAINMENT IN THE HDRs 1990-02

Report Years	Adult Literacy Rate		Mean Years of Schooling		Combined Enrolment Ratio		Basis
	Maximum	Minimum	Maximum	Minimum	Maximum	Minimum	
1990	100.0	12.3	----	----	----	----	Actual
1991-93	99.0	18.2	12.1	0.1	----	----	Actual
1994	100.0	0.0	15.0	0.0	----	----	Norms
1995-02	100.0	0.0	----	----	100.0	0.0	Norms

* Rates and ratios are reported in percentage while schooling is in years.

TABLE 3:
PARAMETERS FOR DETERMINING WELFARE RETURNS OF INCOME FROM THE HDRs

HDR Year	Income			Welfare Returns			Basis for	
	Maximum	Minimum	Threshold	Maximum	Minimum	Range	Threshold	Max/Min
1990	4861	220	4861	3.68	2.34	1.34	AOPL	Current
1991	19221	350	4829	5057	350	4727	AOPL	Rec. Past
1992	20998	380	4829	5059	380	4679	AOPL	Rec. Past
1993	21449	367	4829	5075	367	4708	AOPL	Rec. Past
1994	40000	200	5120	5385	200	5185	WPCI	Norms
1995	40000	100	5120	5448	100	5348	WPCI	Norms
1996	40000	100	5711	6040	100	5940	WPCI	Norms
1997	40000	100	5835	6154	100	6054	WPCI	Norms
1998	40000	100	5990	6311	100	6211	WPCI	Norms
1999- 2002	40000	100	—	8log2	2	>0.4	—	Norms

Note: AOPL= Average of Poverty Lines (of Nine Industrial Countries); WPCI= World Per Capita Income
; log calculated on the basis of 10.

MATHEMATICAL TREATMENT OF INCOME VARIABLE

Introduction

The weakest link in the whole exercise is dealing with the income component, which has been accepted as the proxy variable for the capabilities not captured by other two explicitly considered variables.

Before converting income variable, duly expressed in terms of purchasing power parity dollars, into an indicator, it is first converted in terms of level of well-being. It is understood that marginal returns to income in terms of well-being must be at least non-increasing, if not strictly decreasing. It means the curve proposed must be concave, which implies that well-being returns to an average of two incomes will be higher than the average of the corresponding returns to two incomes. The two distinct conditions that ensure it that the first differential derivative has to be positive (non-negative) and the second differential derivative has to be negative (non-positive). We may like to impose some other conditions too. For example, well-being level at zero level of income should be zero or a certain finite negative level or infinitely negative. Well-being level at unit level of income should be negative, zero or positive. Well-being should be measured in terms of the unit in which income is measured. There may exist a variety of forms, which may possess some or all of these properties. We shall consider however half a dozen such forms, which have been proposed by the UNDP, Anand and Sen and some other contributors.

Logarithmic Transformation With Cap

To begin with, the UNDP came out with the proposal that not only well-being curve should reflect diminishing marginal returns with respect to income but beyond a certain level it should stop yield any additional returns to income. The UNDP (1990, p.12) said:

... 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.

One can note that the phrase human capabilities used in the above quotation is replaced by the phrase human well-being in HDR 1991 (UNDP, 1991, p.88).

With a view to emphasizing the importance of poverty alleviation, it is said, this decision was taken by the UNDP (1990, p.13), which chose this level to be the average of the official poverty lines of nine industrial countries (Australia, Canada, the FRG, the Netherlands, Norway, Sweden, Switzerland, the U.K., the U.S.), which was ppp\$4861. This fact is more explicitly stated in the report of the next year (UNDP, 1991, p.89; p.90) that income up to the poverty line has a full weight and above it zero. Though it is difficult to agree with this proposal on many counts, yet we choose to ignore questioning the proposal because our purpose here is to examine the theoretical soundness of the proposal. Thus, in a way income distribution was truncated from below at some level. For income variable y and cap level of income y^* , and well-being variable W , we can write the proposal as:

$$\begin{aligned} W &= \log y, & 0 < y \leq y^* \\ W &= \log y^*, & y \geq y^* \end{aligned}$$

It is easy to note that this transformation, before the level of y^* , has positive first differential and negative second differential and, beyond y^* , both the differentials as zero.

However, it would not admit zero level of income. At unit level of income, irrespective of choice of the level of unit in which income is being measured, the well-being level will be zero. The unit in which well-being is measured is not known.

Kolm-Atkinson Formulation

That was in the year 1990. The next year the UNDP (1991, p.2; p.15) accepted that the decision to assume that income beyond the poverty level and thereby giving it zero weight was not proper as it was too drastic an adjustment and decided to give a progressively diminishing weight to income in this range. It carries out an experiment and reports in Technical Note 1. It considers a general formula, which is a utility function with isoelastic marginal utility function, viz.,

$$W = \frac{y^{1-\varepsilon}}{1-\varepsilon}$$

Its elasticity of marginal W is constant. This elasticity may be defined as:

$$\eta = -\frac{d \log(dW / dy)}{d \log y} = -\frac{W'' / W'}{1/y} = -y \frac{W''}{W'}$$

Differentiating the above function twice we find that

$$W' = y^{-\varepsilon}$$

$$W'' = -\varepsilon y^{-\varepsilon-1}$$

$$\eta = -y \frac{-\varepsilon y^{-\varepsilon-1}}{y^{-\varepsilon}} = \varepsilon$$

This formulation is also known as Kolm or Atkinson function, has constant relative inequality aversion parameter. The UNDP did not use this formulation—perhaps it was interested in a variable elasticity function and wanted to relate income with poverty level. Trabold-Nubler (1991) has suggested for use of this form itself and set ε equal to 0.5 for his own exercise.

Two-Term Alleged Atkinson Formulation

It may be noted that for $\varepsilon \leq 0$ the Atkinson formulation yields a linear curve with no diminishing returns through the range (and no aversion to inequality; simple summation for different persons will do). When $\varepsilon \leq 1$, we can see that it approaches to $\log y$. For an indeterminate form of $0/0$, L'Hospital Rule suggests us to try out the ratio of the first differentials of the numerator and denominator at the limit value.

$$W = \frac{d(y^{1-\varepsilon})/d\varepsilon}{d(1-\varepsilon)/d\varepsilon} = \frac{-y^{1-\varepsilon} \log y}{-1} = \log y$$

We know that common log reduces 10 to 1, 100 to 2, 1000 to 3 and so on. Thus there is a heavy discount of income if we give ε a value of unity. Which means there marginal returns diminish too drastically. And it is useless to try a value beyond unity.

Now, if one wishes to moderate discounting factor, the UNDP (1991, p.89) suggests to assign ε a value of zero for income up to y^* and $1/2$ thereafter. Thus for an income in range one (below y^*) and for an income in range (beyond y^*), the transformation used in the experiments was the following:

$$\begin{aligned} W &= y, & y &\leq y^* \\ W &= y^* + 2(y - y^*)^{1/2}, & y &\geq y^* \end{aligned}$$

It may be noted in the UNDP report (p.89), the first term in the RHS of the second part is written as y not y^* . I have used \geq instead of $>$.

Chaubey (1998, p. 520) had examined noted the problem related to curvature and had shown that the sum of piecewise Atkinson does not turn out to be an Atkinson. It was expected that the slope of the second piece was less than that of the first piece. To put it more sharply the slope of the first piece towards the end of the range should be greater than

the slope of the second piece right in the beginning. But that does not happen. The slope of the first range is equal to 1 irrespective of the level of income. The slope of the second range varies with income as it is found to be:

$$\frac{dW}{dy} = \frac{1}{(y - y^*)^{1/2}}$$

which is greater than 1 for $y^* < y \leq y^* + 1$. Even while the slope of the second portion becomes lower than the first portion after $y^* + 1$, the level of W remains higher than W according to the first part of the formula upto $y^* + 4$ was shown by Chaubey (1998, p.520). Designating well-being according to the first when unconstrained as W_u and that according to second part as W_c , we can write them for income level $y^* + k$:

$$W_u = y^* + k$$

$$W_c = y^* + 2k^{1/2}$$

Which one is higher will depend on the value of k . For $k=0$, both are equal. For $k=1$, constrained W_c is higher than W_u while as per intentions of the UNDP, it should be lower. Trabold-Nubler (1991) has called it the first dollar anomaly. In fact it is a 'first dollars' anomaly. W_c is higher than W_u for k upto 4 units.

Poly-Term Alleged Atkinson Formulation

When it comes to actual modification, the UNDP (1991, p.90) actually divides the income range in terms of multiple of poverty line y^* . Thus, most countries are between 0 and y^* , some in y^* and $2y^*$, few in $2y^*$ and $3y^*$ and still fewer $3y^*$ and $4y^*$ and so on. Setting ϵ equal to 0 for the first range, $\frac{1}{2}$ for the second range, $\frac{2}{3}$ for the third range, $\frac{3}{4}$ for the fourth range, and $(\alpha/(\alpha+1))$ for the α th range, one can produce:

$$\begin{aligned}
W &= y && \text{for } 0 < y \leq y^* \\
W &= y^* + 2(y - y^*)^{1/2} && \text{for } y^* < y \leq 2y^* \\
W &= y^* + 2y^{*1/2} + 3(y - 2y^*)^{1/3} && \text{for } 2y^* < y \leq 3y^* \\
W &= y^* + 2y^{*1/2} + 3y^{*1/3} + 4(y - 3y^*)^{1/4} && \text{for } 3y^* < y \leq 4y^*
\end{aligned}$$

and so on.

For the range $(\alpha y^*, (\alpha+1)y^*)$ with integer $\alpha \geq 1$ but not zero, the above formulation could be written in summary form. For the range income below y^* , the formulation continues to be the same. Thus, the above formulation could be reduced as follows:

$$\begin{aligned}
W &= y && \text{for } 0 < y \leq y^* \\
W &= \sum_k^{\alpha} k(y^*)^{1/k} + (\alpha+1)(y - \alpha y^*)^{1/(\alpha+1)}, && \text{for } \alpha y^* \leq y \leq (\alpha+1)y^* \text{ and } \alpha \geq 1
\end{aligned}$$

The generalized formulation given in Chaubey (2002) is not correct.

According to Anand and Sen (2000), the motivation for using this formulation was to incorporate the consideration that 'the higher the income relative to the poverty level (y^*), the more sharply the diminishing returns affects the contribution of income to human development', which is achieved by adding together the concave pieces with increasing values of ϵ . Trabold-Nubler (1991), Banerjee (1996), Chaubey (1998) and Anand and Sen (2000), among others, have seen a number of problems and inconsistencies in this formulation.

Bhatnagar (1999), in his dissertation done under Chaubey, extended Chaubey's result for subsequent ranges. For income stretch k immediate after αy^* , k depending upon the value of α , the slope of the succeeding portion of the curve exceeds that of the preceding portion. As a result, at income level of $(\alpha y^* + k)$, W , if unconstrained by the limit αy^* is found to be lower than constrained W . For example, for income $2y^* + k$, unconstrained W_u , which ought to be higher, is found to be lower than constrained W_c .

We can see that

$$W_u = y^* + 2(2y^* + k - y^*)^{1/2} = y^* + 2(y^* + k)^{1/2}$$

$$W_c = y^* + 2y^{*1/2} + 3(2y^* + k - 2y^*)^{1/3} = y^* + 2y^{*1/2} + 3k^{1/3}$$

Now let us see the inequality relationship between the two. Putting the inequality relation as R between the W_u and W_c , we can write the following sequence:

$$\begin{aligned} &(W_u) R (W_c) \\ &[2(y^* + k)^{1/2}] R [2y^{*1/2} + 3k^{1/3}] \\ &4(y^* + k) R [4y^* + 9k^{2/3} + 12y^{*1/2} k^{1/3}] \\ &4k R [9k^{2/3} + 12y^{*1/2} k^{1/3}] \\ &[4k - 9k^{2/3}] R [12y^{*1/2} k^{1/3}] \\ &[4k^{2/3} - 9k^{1/3}] R 12y^{*1/2} \end{aligned}$$

The right hand side of this expression is positive. But left hand side will be non-negative only when $0 < k < (9/4)^3$, which is the minimum requirement. This k is about 11.4 units.

Through patient undertaking of this kind of exercise, cubing and quadrupling and using binomial expansion, Bhatnagar (1999, pp.69-75) has developed the upper limits of k for next five ranges. Adding some initial result to his Table and extending Bhatnagar's table for extra ranges, we can produce the following Table. See Table 1.

Income range	Income level	Upper limit	Reduced form	Value
1y* □ y □ 2y*	y=1y*+k	2 ²	[(2) ¹] ²	4.0
2y* □ y □ 3y*	y=2y*+k	(9/4) ³	[(3/2) ²] ³	11.39
3y* □ y □ 4y*	y=3y*+k	(64/27) ⁴	[(4/3) ³] ⁴	31.57
4y* □ y □ 5y*	y=4y*+k	(625/256) ⁵	[(5/4) ⁴] ⁵	86.74
5y* □ y □ 6y*	y=5y*+k	(7776/3125) ⁶	[(6/5) ⁵] ⁶	237.37
6y* □ y □ 7y*	y=5y*+k	(117649/46656) ⁷	[(7/6) ⁶] ⁷	648.28
7y* □ y □ 8y*	y=5y*+k	(2097152/823543) ⁸	[(8/7) ⁷] ⁸	1768.27
8y* □ y □ 9y*	y=5y*+k	(43046721/16777216) ⁹	[(9/8) ⁸] ⁹	4819.27
9y* □ y □ 10y*	y=5y*+k	(1000000000/387420489) ¹⁰	[(10/9) ⁹] ¹⁰	13127.26

Source: Extended Bhatnagar's (1999) on p.75

Through mathematical induction, Bhatanagar is able to show that for income level $\alpha y^* + k$, the condition for k is

$$0 < k < [(\alpha + 1) / \alpha]^\alpha$$

which for $\alpha=8$, turns out to be more than 4800 and at $\alpha=9$, more than 13000. This is what

Trabold-Nubler (1991) had noted:

... the way in which the UNDP technically incorporates the idea of diminishing returns in the income variable is false. UNDP divides the full range of income into multiples of the poverty line (\$4829) and treats each of these multiples differently. This leads to a violation of the concept of diminishing returns, as there are several cases when an additional unit of income contributes more to human well-being than the previous one. Firstly, the first dollar of each multiple of the poverty line contributes more to human well-being than the previous one. For instance, a rise in real GDP from \$9657 to \$9658 increases adjusted GDP or human well-being by less than \$0.1 dollar. An increase in real GDP by another dollar from \$9658 to 9659, however adjusted GDP by \$3. Moreover, the first dollar of any multiple of the poverty line contributes less to human well-being than the first dollar of the next multiple. The first dollar of the second multiple of the poverty line adds \$2 to human being, the first dollar of the third multiple of the poverty line adds \$3, and so on. Although these cases violate the principle of diminishing returns, one could overlook this "first dollar" anomaly, if each additional multiple of the poverty line as a whole would contribute less to human well-being than the previous one. The concept of diminishing returns would properly reflected, at least from a global point of view. Unfortunately, this is not the case. Only the first multiples of the poverty line contribute less to human well-being than the previous one. Starting from with the ninth multiple, each additional multiple of the poverty line contributes more to human well-being than the previous one.

However, Trabold-Nubler could not crack the real problem as he did not explore the mathematical properties. He concentrated more on the numbers. Chaubey-Bhatnagar formulation shows that there exists problem right from the beginning. In fact, there is no restriction on the poverty line. It could be \$1 (or \$2). Let us measure GDP per day. Then one first dollar yields 1 unit well-being, two dollars yield 3 units, three dollars six, four dollars 10 units, and so on. But what is this unit? It is not dollar. It is changing mongrel of units for each range.

Anand and Sen (2000) derive left-hand and right-hand derivatives of W at $y=\alpha y^*$.

For left hand derivative, we find the derivative for interval $((\alpha-1)y^*, \alpha y^*)$ at its farthest end, which is found to be finite. Taking limit for $y \uparrow \alpha y^*$, we find that the following derivative

$$\frac{dW}{dy} = ((y - (\alpha - 1)y^*)^{-(\alpha-1)/\alpha}$$

gives us $1/y^{*(\alpha-1)/\alpha}$, which is a finite positive number for $\alpha \geq 1$. Further, this will go on diminishing as the range increases provided $y^* > 1$. However, for right hand derivative of the curve at $y=\alpha y^*$, we should differentiate the curve for interval $(\alpha y^*, (\alpha+1)y^*)$, which is

$$\frac{dW}{dy} = (y - \alpha y^*)^{-\alpha/(\alpha+1)} = 1/(y - \alpha y^*)^{\alpha/(\alpha+1)}$$

This slope is infinite in limit when $y \downarrow \alpha y^*$ irrespective of order of range. Thus, the slope immediately jumps at the juncture of any two ranges.

Anand and Sen (2000) have also calculated elasticity too and have shown that it tapers from ∞ to α in the range $(\alpha y^*, (\alpha + 1)y^*)$.

The issue posed by Chaubey in 1998 paper as layman's question and in 2002 paper as issue of dimensional homogeneity is mildly noted by Anand and Sen (2000, p.90 and n.6). They say that the number this function generates will be a utility or well-being (utils or units of well-being), not a dollar figure (ibid, p.90) and point out that a sum of (PPP\$), $(PPP\$)^{1/2}$, $(PPP\$)^{1/3}$, etc., cannot be readily interpreted as a (PPP\$) figure. Chaubey (1998) argued:

An intelligent person who has not read Atkinson and Anand, Sen and Thon, Kakwani and Desai, wonders whether things attempted by the UNDP could really be attempted. He recognizes that there is a 'polynomial' whose second and subsequent terms will not have the same unit but different ones and they will all differ among themselves. Quantities having the same dimensions can definitely be added. Quantities having different dimensions cannot be added. The summation attempted, therefore, is an uneasy one and difficult to interpret. When one changes

the denomination of measurement from dollar to cent, pound to pence or rupee to paise, the results go awry.

Chaubey (2002, p.98) further argued:

(There is involved a) violation of the principle of dimensional homogeneity. According to this principle, quantities with the same only can be added (or even compared). A dollar can therefore not be added to the square root of a dollar, which could not be added to the cube root of a dollar. And this is what has been done in the UNDP formulation. It has to be appreciated that root of a dollar is not root one dollar. In other words, $\sqrt[3]{1\$}$ is not 1\$ but $1\sqrt[3]{\$}$. Were it not so, the root of 100 cents would be 10 cents and 10 cents would be equal to 1\$! In order to appreciate the point made here one should convert dollars into cents and repeat the exercise. As square of a meter is square meter and square root of an are is 10 meters, square root of a dollar is not dollar but square root dollar. Why do we forget this simple proposition when it comes to the UNDP's HDI exercises? (Parentheses and text added.)

However, we take a cue that Anand and Sen will value a formulation, which measures well-being in terms of dollars. When we developed an alternative, we had taken that care.

The UNDP intended to introduce a 'variable elasticity' of marginal valuation through a 'constant elasticity' marginal valuation function, which it failed and introduced a great number of other problems. While the function lost the character of concavity throughout the income range it created the problem of dimensional homogeneity. Anand and Sen (2000) suggest two general classes of function, which accomplish this task rather well. One of these suggestions were made in 1995 and the other in 1999 occasional paper. These suggestions we will discuss a little later.

Simple Logarithmic Transformation

However, the UNDP (1999) decided to follow a simpler course with the argument that discounting in the above procedure was too drastic. It says

The main problem with this formula is that discounts the income above the threshold level very heavily, penalizing the countries in which income exceeds the threshold level. It reduces the \$34000 (PPP) between the threshold and maximum level of income to a

mere \$321. In many cases it loses its relevance as a proxy for all dimensions of human development other than the long and healthy life and knowledge (UNDP, 1999, p.159).

This assertion is not correct, as we will see later. At this we can see that the UNDP just ignored the problems discussed by us. The present formulation adopted by the UNDP is simple logarithmic transformation of y without any threshold and without any cap. The distribution is truncated nowhere. It is:

$$W = \log y \quad y > 0$$

This form has both the derivatives of desirable sign—the first one positive and the second one, negative. Its elasticity is obviously 1. It is the limiting form of the Atkinson formula when α is equal to 1. However, one could note that it would not admit zero value of income and produce zero level of well-being for 1 unit of income irrespective of the size of this unit itself.

In the eyes of the UNDP (1999, p.159), 'this refinement in the treatment of income attempts to rectify (earlier weaknesses) puts 'the methodology more on a more solid analytical foundation. It counts several advantages that this formula has over the earlier one.

Two Proposals Of Anand And Sen

Anand and Sen (1995; 2000) have suggested two forms for rectification of the transformation adopted by the UNDP. In fact, by all accounts whether one refers to the references cited in the paper 2000 paper was written 1996: No reference is beyond 1995, caption of a section refers to the year 1995 and there is no section referring to years beyond. A paper with the same title is referred to in the UNDP (1997) as an occasional paper.

Calling constant absolute inequality aversion function class, Anand and Sen (1995, p.27; 2000, p.93) suggests one class of functions as:

$$W = -e^{-\alpha y} \quad \text{where } y > 0$$

up to a positive affine transformation. It can be shown that the elasticity of this function is γy , a positive function of income and therefore it increases linearly with increase in income.

They point out that the elasticity η starts at 0 when $y=0$. I take it as an important consideration. It may be noted that un-transformed W is equal to -1 at $y=0$, not a bad idea if one construes that income below y^* yields only a negative welfare.

In the other class they suggest a more general class, which combines the constant absolute inequality aversion and constant relative inequality aversion forms (Anand and Sen, 2000, p.94). This is given by

$$W = -y^{-\beta} e^{-\gamma y} \quad \text{where } \beta \geq 0 \text{ and } \gamma \geq 0$$

up to a positive affine transformation. It may be noted that both β and γ cannot be 0 together, otherwise $W = -1$ irrespective of the level of y . This point has not been noted by Anand and Sen. It is understandable that if $\beta=0$, the function will turn into constant absolute inequality aversion. In this case, the elasticity will turn out to be γy . On the other hand if $\gamma=0$, the function will be a constant relative inequality aversion one. In the latter case, it is easy to see that the elasticity is just constant and equal to $(\beta+1)$ throughout the income range. However, for the general form, we may find

$$\eta = (\beta + \gamma y) + \frac{\beta}{(\beta + \gamma y)}$$

which will be $(\beta+1)$ only at $y=0$. These forms have increasing elasticity needed for increasingly discounting the contribution of income to well-being/capabilities/human development.

A New Proposal for Treatment Of Income Variable

Chaubey (1998, 2002) provided an alternative to these formulations, which makes use of the idea of poverty line and follows the principle of diminishing marginal returns to

mere \$321. In many cases it loses its relevance as a proxy for all dimensions of human development other than the long and healthy life and knowledge (UNDP, 1999, p.159).

This assertion is not correct, as we will see later. At this we can see that the UNDP just ignored the problems discussed by us. The present formulation adopted by the UNDP is simple logarithmic transformation of y without any threshold and without any cap. The distribution is truncated nowhere. It is:

$$W = \log y \quad y > 0$$

This form has both the derivatives of desirable sign—the first one positive and the second one, negative. Its elasticity is obviously 1. It is the limiting form of the Atkinson formula when α is equal to 1. However, one could note that it would not admit zero value of income and produce zero level of well-being for 1 unit of income irrespective of the size of this unit itself.

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Calling constant absolute inequality aversion function class, Anand and Sen (1995, p.27; 2000, p.93) suggests one class of functions as:

$$W = -e^{-\gamma y} \quad \text{where } \gamma > 0$$

income beyond poverty line y^* . These were the intentions of the UNDP, which it failed to realize. While Anand-Sen formulations have attractive properties of positive first differentials and negative second differentials, they fail to make use of poverty line, that is, to truncate the distribution of income at y^* . Even if one adds y^* to these formulations, only infinite income will make $W=y^*$. Chaubey (1998, p.520; 2002, pp.98-99) suggested a two-part formulation, one for income below poverty line, where the advice of the UNDP has been accepted and the other for income beyond poverty line, where a new suggestion has been made. This formulation is:

$$\begin{aligned}
 W &= y && \text{for } y \leq y^* \\
 W &= y^* + y^* (\log(y/y^*)) && \text{for } y \geq y^*
 \end{aligned}$$

It is easy to see that the first differential of the first part is 1 and of the second part is (y^*/y) which diminishes as y increases but approaches 1 as y approaches y^* . The second differential of the first part is zero while of the second part is $(-y^*/y^2)$. These are all desirable properties. The elasticity of the first part is 1 while that of the other is $1/(1+\log(y/y^*))$. Thus, elasticity of function increases as income increases. Which is a required property for discounting higher income at higher rate.

This will help in measuring well-being returns of income in terms of unit of measurement of income. Well-being returns of income zero are zero and increase as income increases.

As I have insisted that income can be measured in any multiple of unit. Ten thousand dollars may be treated as one unit and so can be the case of 10 cents. Smaller areas are measured in ares, larger areas in hectares and still larger in square kilometers. Meters and kilometers are both used for measuring length.

There have been suggested two extensions of this approach. Inspired by the above formulation one is attempted by Pradhan in which a non-logarithmic alternative is proposed. It is:

$$W = y \quad \text{for } y \leq y^*$$

$$W = y^* + y^*[1 - (y^*/y)] \quad \text{for } y \geq y^*$$

Its slope is $(y^*/y)^2$ instead of just (y^*/y) which was in Chaubey's formulation. Its second derivative is negative $(-2y^{*2}/y^3)$. One can moderate the formulation by adding some parameter less than 1 as multiplicand to the factor (y^*/y) .

The other is an attempt by Bhatnagar (1999). He writes the Chaubey formula for each range which is in multiple of $2y^*$ in the following manner:

$$W = y \quad \text{for } 0 < y \leq y^*$$

$$W = y^* + y^* \log(y/y^*) \quad \text{for } y^* < y \leq 2y^*$$

$$W = y^* + (1/2) \log(2) + (1/2) \log(y/y^*) \quad \text{for } 2y^* < y \leq 4y^*$$

$$W = y^* + (1/4)(2 \log 2 + \log 4) + (1/4) \log(y/y^*) \quad \text{for } 4y^* < y \leq 6y^*$$

$$W = y^* + (1/8)(4 \log 2 + 2 \log 4 + \log 6) + (1/8) \log(y/y^*) \quad \text{for } 6y^* < y \leq 8y^*$$

Bhatnagar (1999) did succeed in summarizing, from the third step onward, that for the income beyond $2y^*$, in the following manner:

$$W = y^* + \left[\sum_{m=1}^n (1/2)^m y^* \log(2m) + (1/2)^n y^* \log(y/y^*) \right]$$

for $2my^* < y \leq 2(m+1)y^*, m \geq 1$

Bhatnagar could establish that the slope $(1/2)^m(y^*/y)$ goes on decreasing with increase in income. However, there is little rationale for writing the formula the way he did. His results do reveal that there exists no anomaly, which was observed in the UNDP multiple-step formulation.

However, in the construction of actual index, I shall confine to my own formulation.

Comparison of UNDP Formulations with New Proposal

It would be easy to see that logarithmic formulations as proposed by the UNDP do not admit the value of zero while the UNDP poly-term formulation and the proposal by Chaubey admit it. For unit income, irrespective of the size of the unit, again both logarithmic formulations give zero welfare returns, whereas while the UNDP poly-term formulation and the proposal by Chaubey give equivalent returns and they are in the same unit of measurement and therefore may be converted into higher and lower denominations.

Both the logarithmic formulation by the UNDP and the one by Chaubey show the essential property of diminishing marginal returns. However, Chaubey formulation shares the property of constant returns until the threshold with the poly-terms UNDP formulation. But the poly-terms UNDP formulation utterly fails in respecting essential property of diminishing marginal returns. For a threshold income of 5000 units, one can notice that there exists a flip-flop tendency in marginal returns, which none of these formulations show. On four counts that returns for zero income is zero, for positive income is positive, up to the threshold level, the returns are constant and thereafter the returns are diminishing, our proposal wins the race.

Comparing the logarithmic formula with the poly-term formula, the UNDP (1999, p.159) writes the following:

The main problem with this (poly-term) formula is that it discounts the income above the threshold level very heavily, penalizing the countries in which income exceeds the threshold level. It reduces the \$34000 (PPP) between the threshold and maximum level of income to a mere \$321. In many cases it loses its relevance as a proxy for all dimensions of human development other than the long and healthy life and knowledge.

This year's refinement in the treatment of income attempts to rectify this problem by putting the methodology more on a more solid analytical foundation. The rationale and the formula adopted in the refinement are discussed in details in

Anand and Sen (1999). To summarize, in the construction of this year's HDI income is treated using the following formula

$$W(y) = \frac{\log y - \log y_{\min}}{\log y_{\max} - \log y_{\min}}$$

There are several advantages to this formula. First, it does not discount income as severely as the formula earlier used. Second, it discounts all income, not just the income above a certain level. Third, as the figure (very similar one to the we have drawn here) shows, the asymptote starts quite late so middle-income countries are not penalized unduly; moreover, as income rises further in these countries they will continue to receive recognition for their increasing income as a potential means for higher human development.

Most of these assertions are incorrect. The poly-term formula contributes more than logarithmic formula to the HDI beyond \$3000, as can be seen from the graph given towards the end of the chapter. Thus, contrariwise, these are the low-income countries, which are penalized in terms of showing low HDI. All countries having income above \$3000 get premium by old formula. Yes, this is true that addition to the HDI due increase in income will be lower when old formula is applied.

The following Table 1 presents the case for income upto 50000 units with threshold at 5000 to show the problems that different formulations have. The worst thing that the poly-term formulation has is that its unit of measurement is unknown and its marginal returns decrease, increase and then decrease as shown for different multiple of 5000 units. This is something never admitted by the UNDP. The UNDP (1999) admitted that the discount is too severe and cited as the reason for replacing by the logarithmic transformation. Logarithmic transformations have a problem that they do not admit values below one unit or yield negative returns. Our proposal measures welfare in the units of income and follows the footsteps of Marshall, who measured marginal utility of a commodity in terms of its price and Sen, who measured welfare in terms of income adjusted for inequality coefficient.

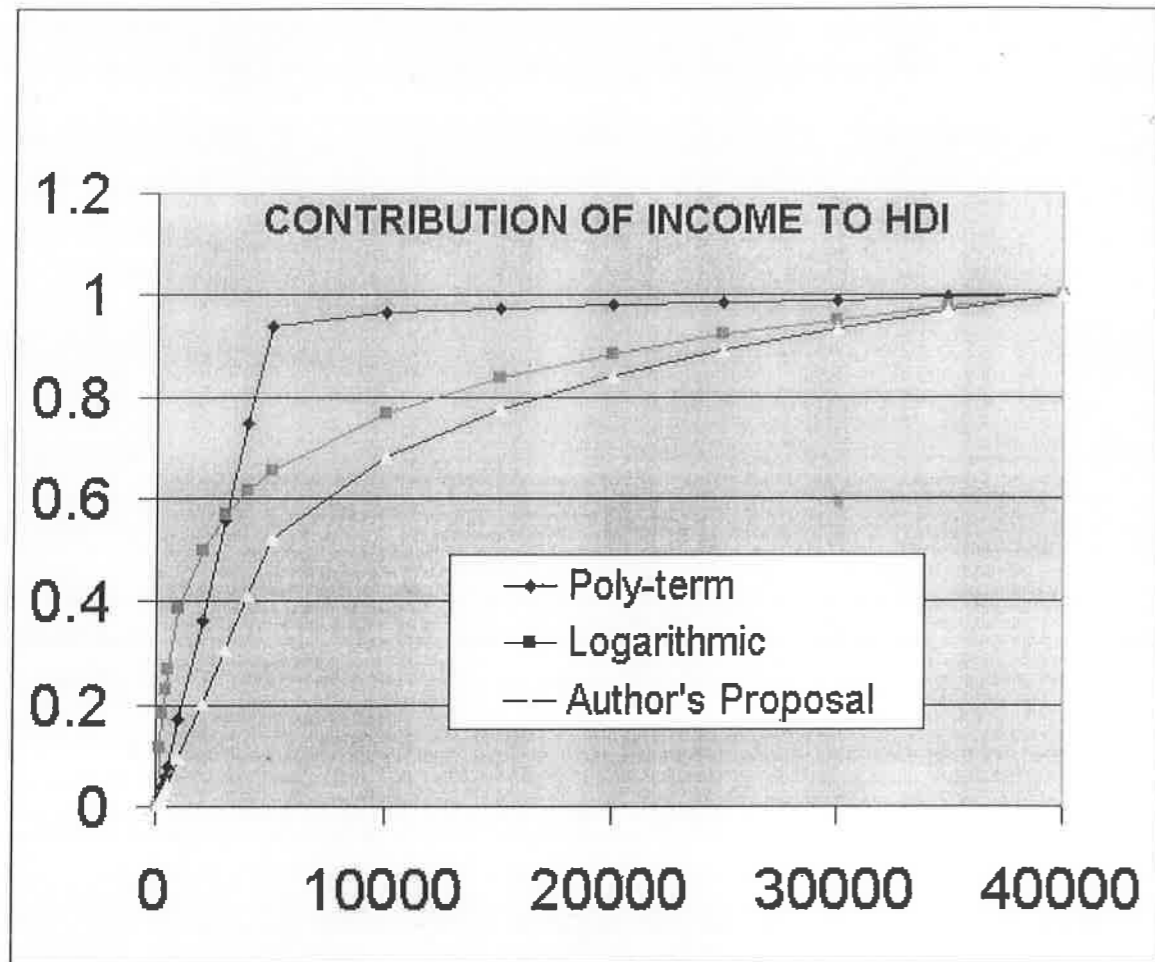
Income	Log with cap		Log without cap		Poly-term UNDP		New Proposal	
	Value	Marginal	Value	Marginal	Value	Marginal	Value	Marginal
0	???		???		0		0	
1	0	???	0		1	1	1	1
2	0.3010	0.3010	0.3010	0.3010	2	1	2	1
3	0.4771	0.1761	0.4771	0.1761	3	1	3	1
4	0.6021	0.1249	0.6021	0.1249	4	1	4	1
5	0.6989	0.0969	0.6990	0.0969	5	1	5	1
6	0.7781	0.0792	0.7782	0.0792	6	1	6	1
7	0.8450	0.0669	0.8451	0.0669	7	1	7	1
8	0.9031	0.0580	0.9031	0.0580	8	1	8	1
9	0.9542	0.0512	0.9542	0.0512	9	1	9	1
10	1	0.0458	1	0.0458	10	1	10	1
100	2		2		100		100	
200	2.3010	0.30103	2.3010	0.30103	200	100	200	100
300	2.4771	0.17609	2.4771	0.17609	300	100	300	100
400	2.6020	0.12494	2.6020	0.12494	400	100	400	100
500	2.6989	0.09691	2.6989	0.09691	500	100	500	100
1000	3		3		1000		1000	
2000	3.3010	0.30103	3.3010	0.30103	2000	1000	2000	1000
3000	3.4771	0.17609	3.4771	0.17609	3000	1000	3000	1000
4000	3.6020	0.12494	3.6020	0.12494	4000	1000	4000	1000
5000	3.6990	0.09694	3.6990	0.09694	5000	1000	5000	1000
5000	3.6990	0.09694	3.6990	0.09694	5000	1000	5000	1000
10000	3.699	0	4	0.301	5141.42	141.4214	6505.1	1505
15000	3.699	0	4.1761	0.1761	5192.72	51.29928	7385.6	880.5
20000	3.699	0	4.3010	0.1249	5226.36	33.63586	8010.3	624.7
25000	3.699	0	4.3979	0.0969	5248.33	21.97121	8494.9	484.6
30000	3.699	0	4.4771	0.0792	5273.14	24.81111	8890.8	395.9
35000	3.699	0	4.5441	0.0669	5296.77	23.63319	9225.5	334.7
40000	3.699	0	4.6021	0.058	5319.97	23.19857	9515.4	290
45000	3.699	0	4.6532	0.0512	5341.16	21.18714	9771.2	255.8
50000	3.699	0	4.6990	0.0458	5364.59	23.43702	10000	228.8
Zero income	Not admitted		Not admitted		Admitted		Admitted	
Unit income	Welfare returns zero		Welfare returns zero		Welfare returns equal to unit		Welfare returns equal to unit	
Marginal returns	Ever diminishing till threshold/cap and zero returns thereafter		Ever diminishing		Constant before threshold and Flip-flopping after threshold		Constant before threshold and Ever diminishing after threshold	
Unit of welfare returns	Log of the unit of income		Log of the unit of income		Inadmissible		Unit of income	

It is important to remember that it is the normalized value of the welfare returns that matters in the construction of the human development index. It is here that the UNDP

(1999, p.159) is confused. It is irrespective of the virtues and weaknesses a particular formulation of welfare returns from the income, which may interest the purist. The UNDP has considered PPP\$100 as the minimum and PPP\$40000 as the maximum. Using these figures for the three formulations, poly-term formulation and unbound logarithmic formulation, both by the UNDP and the new formulation proposed by the author, we present a table showing the results. Even though the poly-term formula drastically discounts the income above the threshold level, in terms of its contribution to HDI, the poly-term formula contributes to the maximum extent, higher than the alternative formula proposed in terms of logarithmic transformation.

Income	Poly-term	Logarithmic	Proposal	Income	Poly-term	Logarithmic	Proposal
100	0	0	0	5000	0.9387	0.6529	0.5204
200	0.0192	0.1157	0.0106	10000	0.9658	0.7686	0.6803
300	0.0383	0.1834	0.0212	15000	0.9756	0.8363	0.7738
400	0.0575	0.2314	0.0319	20000	0.9821	0.8843	0.8401
500	0.0766	0.2686	0.0425	25000	0.9863	0.9215	0.8916
1000	0.1724	0.3843	0.0956	30000	0.9910	0.9520	0.9337
2000	0.3640	0.5000	0.2018	35000	0.9955	0.9777	0.9692
3000	0.5555	0.5677	0.3080	40000	1.0000	1.0000	1.0000
4000	0.7471	0.6157	0.4142				

It is easy to see that the logarithmic transformation adds the highest value to the HDI till around PPP\$3200 whereafter it is the poly-term formulation which does so whereas the new proposal is gradual in approach. Despite the fact that the poly-term formulation discounts the income very drastically, a fact noted by the UNDP (1999), this formulation contributes the highest value after the threshold of PPP\$5000. It is no wonder then that after revision in methodology of treatment of income variable, the high HDI countries lost in HDI value while the low HDI countries gained in HDI. And India turned from a low HDI country to medium HDI country.



6

BUSINESS OF INDEX MAKING

Introduction

When we feel a good number of variables capture a particular phenomenon or a state of affairs and find it expedient to compare two situations across time or space, we try to collapse the variables into a single rational number. However, to begin with we have to ensure that a given variable, if not quantifiable in interval scale, can reasonably be accorded a numerical representation. Only such variables as can be ascribed a numerical representation can therefore enter the synthetic variable called index. Insofar as a real situation has certain qualitative dimensions, which in no way can be captured (or there does not exist a way to capture them) through numbers, the resultant index will remain weak to that extent. The index shall only partially capture the situation. If there is no reason to believe that dimensions left out are of marginal significance, the partial index so constructed may do even more harm than good.

Under the belief that for a narrow interval a line segment may be a good approximation for a curve, most indices try to combine various variables in a linear fashion. For adding a number of variables, we first need to multiply each of the variables with such a quantity that each product is in the same unit. But these quantities have to be so chosen as to reflect the relative significance of each variable in constituting the situation. They are often called weights. Further, in order to make valid comparison of the vector,

describing the situation, across units or across time, the weights need to stay constant. In case, they do not stay constant, some method of averaging may have to be adopted. Scholars will recognize that these variables are supposed to be orthogonal.

The short point is that two vectors X^1 and X^2 , both expressing the situations by numerical representation by their elements – particularly if they are not otherwise orderable– can be compared by using an imposed standard vector w^0 . Vector is so multiplied with $w^0 X^1$ and $w^0 X^2$ that $w^0 X^i$ ($i=1,2$) turn out to be two scalars, which are completely orderable. It is easy to see that in most macro economic aggregate while X 's are quantities and w 's are prices and in price indices X 's are prices and w 's are quantities.

In case our X 's are not such that w 's could be easily found, we may find it expedient to standardize X 's into x 's, which means converting a variable with some units of measurement into pure numbers.

We may recall that there are many indices, which are a kind of aggregate and there are others, which are a kind of average. Further, there are indices, which are not confined within an interval (or are not upper bound) and there are others, which are confined within an interval, such as $(0,1)$.

Sometimes some indices are more geared to compare spatial units and sometimes to compare the same unit over time. To handle the two comparisons together poses some conceptual problems, which are usually put under the carpet.

We shall describe the business of index making in this limited context in following three steps: (i) selection of variable, (ii) standardization of variables and (iii) developing weighting system. It would be noted that a kind of weighting is involved even in standardization of variables.

Selection Of Variables

Selection of variables in the case of social states, phenomena and processes is invariably found to be difficult. Our search is normally for independent variables, that is, independent elements in the vector that characterizes a social situation. First, it is difficult to find such variables. Second, in case one can find theoretically independent variables, they are found to be empirically co-moving or correlated – many a time in linear fashion.

When two suggested variables are found highly correlated, any one of them or any combination of them would do equally well. As a result sophisticated exercises in fixing weights lose much significance.

However, there is often found a tendency among scholars, to include more and more variables in the construction of a social index like HDI. While the whole purpose of this new exercise was to present an alternative to a myriad of development indices which tried to capture an amalgam of inputs to development processes and outputs thereof as well as a powerful supplement to income indicator of GDP through an index of outcome, we find that many ingredients of the two are entering from backdoor. Part of the blame goes to the original UNDP team who could not resist including GNP per capita as a component of the HDI. Now, some people have added in the list of variables such items as access to safe drinking water, electricity connection, enjoyment of two squares a meal a day throughout the year, residence in pucca houses, availability of beds in public hospitals, etc., without regard whether the indicator suggested is an end or a means or whether it is an input to or output of a process, or outcome for the human beings.

According to the UNDP's HDRs, the HDI is said to capture three dimensions of capability viz., long and healthy life, knowledge and access to resources for leading a

decent life. Long and healthy life dimension has been captured through longevity or life expectancy at birth. Longevity does not of itself suggest that life is healthy too.

Knowledge started its journey with adult literacy rate alone but took along mean years of schooling for couple of years and later discarded it in favour of combined enrolment ratio.

Access to resources for leading a decent life was accessed through per capita income, which was measured in terms of PPP\$--understandably as the basic exercise was done for international comparison. However, it is not per capita income as such that is used but a transform of it so that each increment in income beyond a level brings in diminishing returns. There were committed certain

Standardization Of Variables

Standard variables are unit-less. If the exercise is about averaging, standardization is done by normalizing the deviation or distance from a particular value (including zero) by a measure of dispersion; and if the exercise is about dispersion, it is effected through normalization of values (or deviations or distances) by a measure of average. One may recall standardization or normalization in case of normal statistical distribution for the former and calculation of coefficient of variation for the latter.

Let us remember that the indicators used in this exercise are aggregative in nature and many observations made below will keep this in view.

In statistical exercises we usually seek the deviation from the arithmetic mean when our exercises are linear in nature. The parameter is obtained from the distribution itself. Many exercises point out how a particular state average is faring in comparison to the national average – whether it is a case of per capita income or of literacy. Many would

however find it better that the comparison be done with the best for judging the level of failure and with the worst for judging the level of achievement. Others would point out that though using the best and the worst is better than using the average as the average is affected by performance of various units, it is still dependent on the performance of some units who would occupy the best or the worst places. Instead if ever-best and ever-worst are used in place of current best and current worst, it would still be better. Naturally, ever-best and ever-worst would also be circumscribed by the data availability for all units which are part of the exercise. For this reason as well as for the reason that even the ever-best has some notches to scale up and ever-worst may happen in future, suggestions were made that 'best' and 'worst' could be substituted by universal, eternal, natural or reasonable kind of numbers. In many cases, but by no means in all, they are just 1 and 0. For example, worst literacy rate one could imagine is zero though in the second half a century no country had worse than 10 percent; there could of course be villages with zero percent literacy rate. And HDI exercise could go up to village level, the UNDP could well argue, and it did, that zero could be ideal as the benchmark. The highest literacy rate is naturally 1 or 100 percent. So is the case with enrolment ratios.

The same could not be said about life expectancy at birth or per capita income. In the case of life expectancy it would appear non-sensible. But the UNDP has also tried to confine the standardized variable to assume values between zero and unity. It could be possible only when the measure of dispersion used is the range of the distribution or augmented distribution, which includes the imposed minimum and maximum values.

To begin with the UNDP started with the following standardization for criterion i:

$$X_{ij} = \frac{\text{Actual } X_{ij} - \text{Min}_j X_{ij}}{\text{Max}_j X_{ij} - \text{Min}_j X_{ij}}$$

Later it was modified to accommodate the best and the worst performances in recent history.

$$X_{ijt} = \frac{\text{Actual } X_{ijt} - \text{Min}_{j,t} X_{ijt}}{\text{Max}_{j,t} X_{ijt} - \text{Min}_{j,t} X_{ijt}}$$

Still later, it was further modified to

$$X_{ijt} = \frac{\text{Actual } X_{ijt} - \text{Min } X_i}{\text{Max } X_i - \text{Min } X_i}$$

Some of our State Human Development Reports did still better by writing

$$X_{ijt} = \frac{\text{Actual } X_{ijt} - \text{Min } X_i}{\text{Target } X_i - \text{Min } X_i}$$

Let us remember that in some exercises, such as Pal and Pant (1993), division by the maximum value was considered sufficient. No minimum value was required.

It is worth pointing out in the very first report the UNDP devoted quite a few paragraphs to justify that first they should find out deprivation levels for each of the variables and then average the deprivation levels and thereafter subtract the average to find out the human development. Pal and Pant (1993) and quite a few of our State Human Development Reports as well as the early contributions followed the UNDP step in step. Only next to next year, the UNDP realized or they were made to realize the futility of such circuitous approach and they abandoned it.

The values have to be chosen rather carefully. The maximum (M) has to be higher than higher than the maximum recorded. It may represent an unattainable target, like a bliss point (Dutta, Panda and Wadhwa, 1997, p.334). I think reasonably above the maximum recorded but within sight. Else, why do we not put 100 or 120 as the maximum number of years for life expectancy at birth? The minimum (m) can be historical minimum or some

reasonably low number. The purpose is to remove one source of 'externality' in computation of individual HDIs.

Search For Weights

Assigning different weights to different components means attaching differential importance. It is sensible. But if there were no reasons for according different weights to different components/constituents, a very simple procedure would be to assign equal weights. This quite arbitrary procedure is based on the principle of insufficiency of information. And this is what PQLI and HDI did.

However, in the case of HDI, when it comes to assigning weights to subcomponents then arbitrary but unequal weights are assigned by the UNDP. Justifying changes in weighting pattern, our NHDR holds that context, priorities and policy focus should determine the weighting pattern (Planning Commission, 2002). If the subcomponents were to be treated as components then there are four indicators in the UNDP exercises and five indicators in our NHDR. In the UNDP exercise, two weights are equal and other two are different. In the NHDR exercise, there are two pairs of equal weights and the fifth one different.

There is another thinking in index making business and it is that the weights should be discovered from the data itself. As the different data series are not found to be independent in statistical sense, they are resolved into linearly independent variables called principal components, which are some linear combinations of used data series, the coefficients being determined by the principal components methods. These components can just be added together to create the HDI in terms of original components.

There is another suggestion that ranks with each component themselves can be used as weights. Here the weights are not uniform for all the units. The weighted sum has naturally to be divided by the sum of weights to make indices comparable. Known as de Borda rule of cardinalizing ordinal numbers, it was popularized in the modern literature on measurement of inequality and popularity by Amartya Sen.

Often the people working in this area make use of the numerical value of HDI for different units to rank them in some order. Then, a suggestion is, rank units by each component and add the ranks for all components for each unit. Then, re-rank the units according to sum total of ranks. However, in case, inter-temporal absolute comparison for judging the progress of a particular unit over time is desired, such an index loses significance.

As K.C. Pant said once that we should be more interested in assessing the progress we made over time than in making inter-national (read inter-unit) comparison all the time.

In case, we do not resort to linear aggregation, which we usually do, we can think of simple geometric mean or a weighted geometric mean. It is known as multiplicative model or log-additive model. Some of the weighting schemes could be used in log-additive model with ease. Meghnad Desai (1993) suggests it as one of the ways for making improvement.

Aggregation Schemes

There abound a good number of aggregative schemes. Linear weighted schemes are simple. We can write them as

$$H_i = \sum_j w_{ij} x_{ij} \quad , \quad \sum_j w_{ij} = 1$$

We can also think of log-linear scheme. This aggregation turns out to be multiplicative or geometric in nature.

$$\log H_i = \sum_j w_{ij} \log x_{ij}, \sum_j w_{ij} = 1$$

There could be people to suggest aggregation of ranks and to re-rank the aggregated ranks. This will definitely not give any absolute value.

Some Other Approaches

One could also opt for ethical or axiomatic approaches, which we refrain to discuss here. However, one particular axiomatic approach suggested by Kakwani (1993) and applied by Dutta, Panda and Wadhwa (1997) deserves to be discussed.

The UNDP, in its first report, first formulated deprivation indices, instead of achievement indices, for the three components. Actual values of achievement were subtracted from the maximum values achievable and the resultants were divided by their respective ranges. The component deprivation indices were first averaged and the average was subtracted from 1 to yield the human development index.

Let achievement index of x be so written as to contain it in the interval $[0,1]$. For maximum value M and minimum value m , the achievement index A can be written as

$$A = f(x, M, m) = 1 - \frac{g(M - x)}{g(M - m)}$$

where $g(\cdot)$ approaches 0 as the argument approaches 0. If achieving more of x is more difficult at higher of x then $g(\cdot)$ has to be concave with respect to x . Kolm-Atkinson formulation comes handy, which is

$$g(x) = \frac{1}{1-\varepsilon} x^{(1-\varepsilon)}, \quad 0 \leq x \leq 1:$$

However, it will fail when $\varepsilon = 1$ as in that case $g(\cdot)$ would become $\ln(\cdot)$ and $\ln(0)$ would approach $-\infty$.

Improvement index be defined as the difference between two levels of achievements in terms of a particular dimension as it related with maximum achievable and minimum possible values:

$$Q = f(x_2, M, m) - f(x_1, M, m) = \frac{g(M - x_1)}{g(M - m)} - \frac{g(M - x_2)}{g(M - m)}$$

Dutta, Panda and Wadhwa (1997) have chosen to use $\alpha = 0.5$. They have used infant mortality rate and child mortality rate for health. As the two indices are negative ones, in order to arrive at deprivation index, instead of subtracting actual values from maximum values, they have subtracted minimum values from the actual values. The ratio of the difference with the range is powered with 0.5. Subtracting this result from 1, we get achievement index. Achievement level is x but achievement index is A .

For achievement in education they have used primary (classes 1-5; age-group 6-11 years), middle (classes 6-8; age group 11-14 years) and high school (classes 9-11/9-12; age group 14-17/14-18 years). The same procedure seems to have been adopted. For income, they have reported deprivation index. The writing is not careful. They report that deprivation index for income = $\ln Y$.

RECONSTRUCTION OF HUMAN DEVELOPMENT INDEX DATABASE, METHODOLOGY AND RESULTS

Introduction

The Human Development Report is purportedly produced to assess the state of human development across the globe. It picks up a theme for policy analysis each year. It says it combines thematic policy analysis with detailed country data that focus on human well-being, not just economic growth (UNDP, 2002). It collects information, which is internationally available with different organizations. The data available with international organization may differ from data produced at national level as these agencies make some adjustments in order to harmonize data.

We have wished to carry empirical exercises for comparison across national units over time. We have used the same database with some modifications we deemed fit. We shall first describe the salient features of the UNDP database as reported in the various HDRs, and then discuss the modifications we have made.

UNDP Database

About thirty indicator tables, each with a few to dozen of indicators, are now presented on different aspects—ranging from demographic to social to economic, from environment to employment to crime, from political participation to gender inequality to

refugees and armament. We shall limit ourselves to the data used in the human development index.

Life Expectancy at Birth

The United Nations Population Division (UNPD) is the main source of life expectancy estimates. It derives global demographic estimates and projections biannually. In its latest revision carried out in 2000, it is said to have incorporated the demographic impact of HIV/AIDS, which has led to substantial changes in life expectancy estimates and projections for a number of countries, particularly those in Sub-Saharan Africa. As the UNPD provides three variants of five-year average estimates of life expectancy at birth, the UNDP obtains the estimates for a given year by linear interpolation on medium variant.

Adult Literacy Rate

The United Nations Educational Social and Cultural Organisation (UNESCO) collects literacy statistics through national population censuses. The UNDP uses population estimates and projections made by the UNPD to calculate adult literacy rates. It is however important to note that many developed countries do not provide this information to the UNESCO. In their case, the UNDP assigns 99 percent to their literacy statistics.

Combined Primary, Secondary and Tertiary Gross Enrolment Ratio

Base on data provided by national population censuses and national educational surveys, the UNESCO estimates and projects gross enrolment at different levels. Using population estimates for relevant age groups, the gross enrolment ratios are calculated. For combined enrolment ratio, gross enrolment in all institutions at all levels, restricting to 15th or 16th standards, should be divided by the size of the population, say between 6 to 22 or 23. However, these details are not provided in the UNDP (2002) and unnecessary details on

effect on population composition are given. It is further emphasized that but for the non-availability of net enrolment, net enrolment ratio is not being used.

GDP Per Capita in PPP\$

Basing on the surveys conducted by the International Comparison Programme (IPC), the World Bank provides the data on GDP per capita in PPP rates of exchange, which take account of price differences between countries. It is asserted that by elimination of differences in national price levels, the comparisons of real values for income, poverty, inequality and expenditure patterns are ensured (UNDP, 2002, p.147).

The latest round of IPC surveys covered 118 countries only out of 220 distinct national political entities—many of which are very small. The World Bank provided estimates based on these surveys, through econometric regression (ibid), for another 44 countries and areas. The details of the relationship are not provided. The assumption is of course that the relationships that exist in surveyed countries are valid in non-surveyed countries too.

The base year for the present series of the PPP\$ data in 1996 and the United States is the base country. It is stated that 'the data for the reference year, 2000, were extrapolated using relative price movements over time between each country and the United States' (ibid, p.146). We know besides differential in price movements, growth in GDP has also to be taken into account and they must be doing it.

For the countries not covered by the World Bank, the UNDP collects the PPP estimates from the Penn World Table 6.0.

Our Treatment Of UNDP Database

We have attempted to collect data on these variables from different Human Development Reports. We could go as far as 1992 as reported in 1995 HDR. To begin with there was a lag of three years between the reference year of the data and the year of HDR report. Now the lag has reduced to two years. As a result, the data for the year 1996 was not available. We have interpolated the data. Naturally, the data may not reflect the real scene of the year, particularly with reference to GDP per capita in PPP\$. Similarly if there was a gap of similar nature elsewhere, we used interpolation to fill the gap. Our database thus spans over four variables, nine years and 164 countries.

The data on life expectancy at birth in a few cases is not from the UNPD; they are from some regional organization or national sources. We have accepted them as they are given in the HDRs.

The UNDP assumed adult literacy rates to be 99 for calculation of HDI in the case of rich countries, which do not report this statistics to the UNESCO and also for the countries that reported it to be 100 percent. In certain cases, the data refer to one or two year back in the past. We have reported them as 99 percent.

In the case of combined enrolment ratio, many countries report the combined enrolment ratio to be more than 100 percent. The UNDP treats them as 100 percent. In a few cases, it is asserted by the UNDP that the combined enrolment ratio is an underestimate (say, Luxembourg, which reports it to be 72) as many students are studying abroad. But for the purpose of calculation of HDI, no correction is applied. We have accepted the figures as reported in the HDRs.

In a few cases, the GDP per capita does not belong the year of reference but a year or two ago in the past. The UNDP has just noted the fact but accepted the figure for calculation. We have accepted the figures. However, specifically for 1996, we have taken the figure to be the arithmetic mean of the figures for 1995 and 1997. In the case of a few countries, the GDP per capita has exceeded PPP\$40000, the maximum stipulated figure. For example, in 1999 and 2000, the GDP per capita for Luxembourg was PPP\$42769 and PPP\$50061 respectively. We have accepted the UNDP's treatment for the moment. But we think it proper to raise the maximum limit to PPP\$60000 rather than threat PPP\$50000 as PPP\$40000 in view of the fact that many pockets of the size of Luxembourg (barely 4 lakh) in many big countries may have this level of GDP per capita. In order to have proper estimates of HDI for such smaller units, when such an occasion arises, it is better to raise the limit rather than suppress inequality.

Methodology Adopted

We have accepted equal weights for three components of the HDI. But we have not accepted the weights suggested for two sub-components of the educational attainment. Instead, we have also assigned equal weight to both the sub-components of the educational attainment.

We have accepted the minimum and maximum limits for life expectancy, adult literacy rate and combined enrolment ratio. We have also accepted the minimum limit for GDP per capita in terms of PPP\$ but we have for the moment accepted this maximum limit, which we wish to raise to PPP\$60000 in future exercises..

We have also not accepted any of the UNDP formulations for treatment of income variable for welfare returns. We have also not accepted the other proposals such as one by

Dutta, Panda and Wadhwa (1996) or those used in many of our State HDRs. Instead, we have followed the formulation proposed by Chaubey (1998, 2002).

Results

As was expected in view of the fact that our income formulation contributes less than logarithmic transformation (which in turn contributes less than the poly-term formulation beyond some number around 3100 units) and the poly-term formulation everywhere, the HDI values as estimated here are lower than those reported in the HDR. In the case of high HDI value countries, the HDI value is lower by about 0.005. Thus, Norway's HDI would be 0.938 instead of 0.942. But in the case of the low HDI countries, our methodology shows substantially lower values. In the case of Niger and Sierra Leone, while HDR's values for 2000 are around 0.275, by our methodology, the values do not touch the level of 0.19.

India does not cross the level of 0.5. India starts its journey at 0.412 in 1992 and reaches at 0.481 in 2000, with around 20 percent rise during the decade.

The UNDP divides the countries in the three categories of high-, medium- and low-HDI, depending on whether their HDI value falls in the range of above 0.8, between 0.8 and 0.5 and below 0.5. As our methodology lowers down the HDI values, we have opted for the cut-off points at 0.75 and 0.5 for classification. We definitely find improvement by number of countries in two superior countries. Of the total 164 countries, their distribution according to high-HDI, medium-HDI and low-HDI, is found to be as follows;

Table: Number of Countries According to High-, Medium- and Low-HDI level (1992-2000)

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
High	40	39	41	43	43	43	47	50	52
Medium	71	74	71	72	74	73	69	67	66
Low	53	51	52	49	47	48	48	47	46

However, if one goes a bit deep, one realizes that the countries entering the higher categories are not big, exception apart. For example, Poland, Malaysia and Mexico, with population around 4 crores, 3 crores and 12 crores respectively, entered the league of high-HDI value countries. Otherwise, the countries to cross over from medium level to high level HDI are small countries like Kuwait, Trinidad, Seychelles, Costa Rica, Lithuania or St. Kitts and Nevis (not even 50000 in size) are making movement across the line.

Many exercises are to be conducted in future.

Appendix: Database of State HDRs in India

Quite a few States in India have prepared their HDRs giving details at district level. It was not possible, nor perhaps desirable, to replicate UNPD database or methodology. Some of the States, like Madhya Pradesh and Rajasthan, have prepared even two HDRs. In some cases, not the Government of the State but some other agency took the initiative. Below is provided a bird's eye view of these efforts.

Madhya Pradesh produced two reports—one for 1995 and the other for 1998. In 1995 Report, it used infant mortality rate instead of life expectancy rate, which was not available at district level but in 1998 Report, it constructed a health development index. Similarly, Maharashtra also used infant mortality rate, data for life expectancy being not available for the districts.

When the UNDP was using mean years of schooling, Madhya Pradesh chose school level enrolment ratio (6-19) to combine it with adult literacy rate. In some cases, it was found that enrolment exceeded population (6-19). In such cases, 50 percent of actual enrolment and 50 percent on the basis of some survey formed the basis. In 1995 Report, adult literacy rate was weighted in favour of females but in 1998 report simple literacy rate

was resorted as GDI was separately computed. Again, while the target in 1995 Report was fixed at 80 percent, in 1998 Report, it was made 100 percent.

In the Human Development Report of Karnataka, in recent years, enrolment ratio for primary and secondary (classes I-X; ages 6-16) was used along with adult literacy ratio. Maharashtra, on the other hand used general literacy and mean years of schooling in 2/3 and 1/3 proportions in its educational attainment index.

These states also tried to prepare and use District Domestic Product (DDP). But some used poly-term formulation for welfare returns after developing state level poverty line.

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**STATISTICAL
APPENDIX**

NOTES ON STATISTICS

As explained earlier, the UNDP prepares the database on the basis of data made available mainly from the UNPD on the life expectancy at birth, the UNESCO on educational statistics—now on adult literacy rate and combined enrolment ratio, and the World Bank on GDP in PPP\$ (in US\$ of 1996). Since in many cases there are found to be gaps in information, the UNDP tries to make it good by resorting to other data sources such as the UNICEF or national sources. Still then, it has to interpolate data through some simple statistical techniques. However, the end result is not happy one.

Below are provided some instances to indicate as to how poor is the database on which the indices are prepared and in turn the indices are presented with a lot of gusto.

Life Expectancy at Birth

We may feel bad about certain countries such Burundi, Cameroon, Cote of Ivoire, Ethiopia, Malawi, South Africa, Zambia and Zimbabwe where absolute life expectancy at birth reduced during the nineties. It is surprising that the life expectancy in Rwanda, which has been decreasing no doubt, dips from 47.2 years in 1993 to 22.6 years in 1994 and rises to 43.4 years in 1995. The minimum figure for life expectancy expected by the UNDP is itself 25 years, the figure was treated as 25 years.

Life expectancy being a stock variable cannot show such an erratic pattern. The UNDP cannot just absolve itself, telling this is the figure it could obtain. The data set had therefore had to be treated more seriously because such aberration may depress the morale of countries like Rwanda when an agency like the UNDP, prepares indices which are being given prominence by the international communities.

Adult Literacy Rate

The data on adult literacy rate is obtained from the UNESCO. But for gaps, other sources are usually resorted to. How do you react if you come to know that this stock variable for Namibia is found to be 75 percent in 1995 while it was just 40 percent in 1992 through 1994? For Nepal, it increases from 25.6 percent in 1992 to 39.2 percent in 1993 and then decreases to 27 percent in 1994. In the case of Solomon Islands, this rate was 24 percent in 1992, which becomes 62 percent in 1993. In few other countries, it is found to fluctuate rather widely.

It may be pointed out that for the countries, which did not report this figure to the UNESCO and are actually rich ones, adult literacy rate has been taken as 99 percent. There are countries, which reported it to be more than 99 percent but are not so rich. In their case it was accepted as 99 percent.

Combined Enrolment Ratio

It has accepted by the UNDP that in the case of many small but rich countries like Luxembourg, the combined enrolment ratio gets depressed because many of the children are students elsewhere. Naturally, this base is therefore very weak. This may one reason, Canada's ratio may be losing somewhat while that of the UK, gaining. Yet, it is difficult to believe that Australia's CER jumps from 80 percent in 1995 to 100 percent in 1997 or Belgium's from 86 percent in 1995 to 100 percent in 1997. It may noted that in case this ratio was reported to be more than hundred percent, it was treated as 100 percent.

GDP PER CAPITA IN PPP\$

To convert a country's GDP from its own currency into PPP\$ is a tricky business though far better than to convert it at the exchange rate which is more influenced by trade

and other flows across the countries. Since it is a flow variable, it is very likely that it fluctuates over time, in a few cases, rather widely. Yet, in couple of cases, it becomes difficult to believe. For example, in the case of Angola, the per capita income changes from PPP\$674 in 1993 to PPP\$1600 in 1994 or of Benin reduces from PPP\$1800 in 1995 and PPP\$1270 in 1997 to just PPP\$867 in 1998. In the case of Bhutan it rises from PPP\$790 in 1993 to PPP\$1290 in 1994 and in the case of Chad, it rises from PPP\$ 700 in 1994 to PPP\$1172 in 1995. Djibouti's case is still intriguing: PPP\$1547 in 1992 to PPP775 in 1993 and PPP\$1270 in 1995; and PPP\$ 1266 in 1998 and PPP\$2377 in 1999. So is the case of El Salvador.

It is also significant to note that Luxembourg's GDP per capita income is increasing by leaps and bounds: from PPP\$21520 in 1992 to PPP\$25390 in 1993 to PPP\$34155 in 1994. Down for a few years. Then, it rose from PPP\$30863 in 1997 to PPP\$33505 in 1998, to PPP\$42769 in 1999 and PPP\$500061 in 2000. It created a problem for the UNDP, which treated its incomes of PPP\$42769 and PPP\$50061 equivalent to PPP\$40000!

There are cases of absolute declines. They may be more because the basket chosen of PPP\$ conversion is not appropriate to a particular country. Or, if the figure has been interpolated with the help of a regression exercise, it might not reflect the real situation of the country.

The purpose of this note was to highlight the weakness on the database on which hangs the analysis presented in the HDRs.

DATA TABLE 1: LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	Albania	72.0	72.0	70.5	70.6	71.7	72.8	72.9	73	73.2
2	Algeria	67.1	67.3	67.8	68.1	68.5	68.9	69.2	69.3	69.6
3	Armenia	72.6	72.8	70.8	70.9	70.7	70.5	70.7	72.7	72.9
4	Angola	46.5	46.8	47.2	47.4	47.0	46.5	47.0	45	45.2
5	Antigua and Barbuda	74.0	74.0	74.0	75.0	75.0	75.0	76.0	77.7	79.3
6	Argentina	72.1	72.2	72.4	72.6	72.8	72.9	73.1	73.2	73.4
7	Australia	77.6	77.8	78.1	78.2	78.2	78.2	78.3	78.8	78.9
8	Austria	76.2	76.3	76.6	76.7	76.9	77.0	77.1	77.9	78.1
9	Azerbaijan	70.6	70.7	71.0	71.1	70.5	69.9	70.1	71.3	71.6
10	Bahamas	73.1	73.2	72.9	73.2	73.5	73.8	74.0	69.2	69.2
11	Bahrain	71.6	71.7	72.0	72.2	72.6	72.9	73.1	73.1	73.3
12	Bangladesh	55.6	55.9	56.4	56.9	57.5	58.1	58.6	58.9	59.4
13	Barbados	75.6	75.7	75.9	76.0	76.2	76.4	76.5	76.6	76.8
14	Belgium	76.4	76.5	76.8	76.9	77.1	77.2	77.3	78.2	78.4
15	Benin	47.6	47.8	54.2	54.4	53.9	53.4	53.5	53.6	53.8
16	Bhutan	50.7	51.0	51.5	52.0	56.4	60.7	61.2	61.5	62
17	Bolivia	59.4	59.7	60.1	60.5	61.0	61.4	61.8	62.0	62.4
18	Botswana	64.9	65.2	52.3	51.7	49.6	47.4	46.2	41.9	40.3
19	Brazil	66.3	66.5	66.4	66.6	66.7	66.8	67.0	67.5	67.7
20	Brunei Darussalam	74.2	74.3	74.9	75.1	75.3	75.5	75.7	75.7	75.9
21	Bulgaria	71.2	71.2	71.1	71.2	71.2	71.1	71.3	70.8	70.8
22	Burkina Faso	47.4	47.5	46.4	46.3	45.4	44.4	44.7	46.1	46.7
23	Burundi	50.2	50.3	43.5	44.5	43.5	42.4	42.7	40.6	40.6
24	Cameroon	56.0	56.3	55.1	55.3	55.0	54.7	54.5	50.0	50.0
25	Canada	77.4	77.5	79.0	79.1	79.1	79.0	79.1	78.7	78.8
26	Cape Verde	64.7	64.9	65.3	65.7	67.3	68.9	69.2	69.4	69.7
27	Central African Republic	49.4	49.5	48.3	48.4	46.7	44.9	44.8	44.3	44.3
28	Chad	47.5	47.7	47.0	47.2	47.2	47.2	47.5	45.5	45.7
29	Chile	73.8	73.9	75.1	75.1	75.0	74.9	75.1	75.2	75.3
30	China	68.5	68.6	68.9	69.2	69.5	69.8	70.1	70.2	70.5
31	Colombia	69.3	69.4	70.1	70.3	70.4	70.4	70.7	70.9	71.2
32	Cambodia	51.6	51.9	52.4	52.9	53.2	53.4	53.5	56.4	56.4
33	Comoros	56.0	56.2	56.1	56.5	57.7	58.8	59.2	59.4	59.8
34	Congo	51.3	51.2	51.3	51.2	49.9	48.6	48.9	51.1	51.3
35	Congo, Dem. Rep.	51.3	51.2	51.3	51.2	51.0	50.8	51.2	51.0	51.3
36	Costa Rica	76.3	76.4	76.6	76.6	76.3	76.0	76.2	76.2	76.4
37	Cote of Ivoire	51.0	50.9	52.1	51.8	49.3	46.7	46.9	47.8	47.8
38	Cuba	75.3	75.4	75.6	75.7	75.7	75.7	75.8	75.9	76.0
39	Cyprus	77.0	77.1	77.1	77.2	77.5	77.8	77.9	77.9	78.0
40	Czech Republic	71.3	71.3	72.2	72.4	73.2	73.9	74.1	74.7	74.9

DATA TABLE 1: LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998	****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
41	Denmark	75.3	75.3	75.2	75.3	75.5	75.7	75.7	76.1	76.2
42	Djibouti	48.3	48.4	48.8	49.2	49.8	50.4	50.8	44.0	43.1
43	Dominica	72.0	69.7	72.0	73.0	73.5	74.0	76.0	74.5	72.9
44	Dominican Republic	69.6	69.7	70.0	70.3	70.5	70.6	70.9	67.2	67.1
45	Ecuador	68.8	69.0	69.3	69.5	69.5	69.5	69.7	69.8	67.1
46	Egypt	63.6	63.9	64.3	64.8	65.6	66.3	66.7	66.9	67.3
47	El Salvador	66.4	66.8	69.3	69.4	69.3	69.1	69.4	53.9	69.7
48	Equatorial Guinea	48.0	48.2	48.6	49.0	49.5	50.0	50.4	50.6	51.0
49	Estonia	69.3	69.2	69.2	69.2	69.0	68.7	69.0	70.3	70.6
50	Ethiopia	47.5	47.8	48.2	48.7	46.0	43.3	43.4	44.1	43.9
51	Fiji	71.5	71.6	71.8	72.1	72.4	72.7	72.9	68.8	69.1
52	Finland	75.7	75.8	76.3	76.4	76.6	76.8	77.0	77.4	77.6
53	France	76.9	77.0	78.7	78.7	78.4	78.1	78.2	78.4	78.6
54	Gabon	53.5	53.7	54.1	54.5	53.4	52.4	52.4	52.6	52.7
55	Gambia	45.0	45.2	45.6	46.0	46.5	47.0	47.4	45.9	46.2
56	Georgia	72.8	72.9	73.1	73.2	73.0	72.7	72.9	73.0	73.2
57	Germany	76.0	76.1	76.3	76.4	76.8	77.2	77.3	77.6	77.7
58	Ghana	56.0	56.2	56.6	57.0	58.5	60.0	60.4	56.6	56.8
59	Greece	77.6	77.7	77.8	77.9	78.0	78.1	78.2	78.1	78.2
60	Grenada	70.0	71.0	72.0	72.0	72.0	72.0	72.0	64.6	65.3
61	Guatemala	64.8	65.1	65.6	66.1	65.1	64.0	64.4	64.5	64.8
62	Guinea	44.5	44.7	45.1	45.5	46.0	46.5	46.9	44.5	47.5
63	Guinea Bissau	44.5	43.7	43.2	43.4	44.2	45.0	44.9	44.5	44.8
64	Guyana	65.2	65.4	63.2	63.5	64.0	64.4	64.8	63.3	63.0
65	Haiti	56.6	56.8	54.4	54.6	54.2	53.7	54.0	52.4	52.6
66	Honduras	67.7	67.9	68.4	68.8	69.1	69.4	69.6	65.7	65.7
67	Hong Kong, China (SAR)	78.6	78.7	79.0	79.0	78.8	78.5	78.6	79.4	79.5
68	Hungary	69.0	69.0	68.8	68.9	69.9	70.9	71.1	71.1	71.3
69	Iceland	78.2	78.2	79.1	79.2	79.1	79.0	79.1	79.1	79.2
70	India	60.4	60.7	61.3	61.6	62.1	62.6	62.9	62.9	63.3
71	Indonesia	62.7	63.0	63.5	64.0	64.6	65.1	65.6	65.8	66.2
72	Iran, Islamic Republic of	67.5	67.7	68.2	68.5	68.9	69.2	69.5	68.5	68.9
73	Ireland	75.3	75.4	76.3	76.4	76.4	76.3	76.6	76.4	76.6
74	Israel	76.5	76.6	77.5	77.5	77.7	77.8	77.9	78.6	78.7
75	Italy	77.5	77.6	77.8	78.0	78.1	78.2	78.3	78.4	78.5
76	Jamaica	73.6	73.7	73.9	74.1	74.5	74.8	75.0	75.1	75.3
77	Japan	79.5	79.6	79.8	79.9	80.0	80.0	80.0	80.8	81.0
78	Jordan	67.9	68.1	68.5	68.9	69.5	70.1	70.4	70.1	70.3
79	Kazakhstan	69.6	69.7	67.5	67.5	67.6	67.6	67.9	64.4	64.6
80	Kenya	55.7	55.5	53.6	53.8	52.9	52.0	51.3	51.3	50.8
81	Korea, Republic Of	71.1	71.3	71.5	71.7	72.1	72.4	72.6	74.7	74.9
82	Kuwait	74.9	75.0	75.2	75.4	75.7	75.9	76.1	76.0	76.2
83	Kyrgyz Stan	69.0	69.2	67.8	67.9	67.8	67.6	68.0	67.4	64.6

DATA TABLE 1: LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
84	Lao People's Dem. Rep.	51.0	51.3	51.7	52.2	52.7	53.2	53.7	53.1	53.5
85	Latvia	69.1	69.0	67.9	68.0	68.2	68.4	68.7	70.1	53.5
86	Lebanon	68.5	68.7	69.0	69.3	69.6	69.9	70.1	72.9	73.1
87	Lesotho	60.5	60.8	57.9	58.1	57.1	56.0	55.2	47.9	45.7
88	Libyan Arab Jamahiriya	63.1	63.4	63.8	64.3	67.2	70.0	70.2	70.3	70.5
89	Lithuania	70.4	70.3	70.1	70.2	70.1	69.9	70.2	71.8	72.1
90	Luxembourg	75.7	75.8	75.9	76.1	76.4	76.7	76.8	77.2	77.4
91	Madagascar	56.5	56.8	57.2	57.6	57.6	57.5	57.9	52.2	52.6
92	Malawi	45.6	45.5	41.1	41.0	40.2	39.3	39.5	40.3	40.0
93	Malaysia	70.8	70.9	71.2	71.4	71.7	72.0	72.2	72.2	72.5
94	Maldives	62.1	62.4	62.8	63.3	63.9	64.5	65.0	65.8	66.5
95	Mali	46.0	46.2	46.6	47.0	50.2	53.3	53.7	51.2	51.5
96	Malta	76.1	76.2	76.4	76.5	76.9	77.2	77.3	77.9	78.0
97	Mauritania	51.5	51.7	52.1	52.5	53.0	53.5	53.9	51.1	51.5
98	Mauritius	70.2	70.4	70.7	70.9	71.2	71.4	71.6	71.1	71.3
99	Mexico	70.8	71.0	72.0	72.1	72.2	72.2	72.3	72.4	72.6
100	Moldova, Republic of	67.6	67.6	67.7	67.8	67.7	67.5	67.8	66.6	66.6
101	Mongolia	63.7	63.9	64.4	64.8	65.3	65.8	66.2	62.5	62.9
102	Morocco	63.3	63.6	65.3	65.3	65.7	66.1	66.6	67.0	67.2
103	Mozambique	46.4	46.4	46.0	46.3	45.8	45.2	43.8	39.8	39.3
104	Myanmar	57.6	57.9	58.4	58.9	59.5	60.1	60.6	56.0	56.0
105	Namibia	58.8	59.1	55.9	55.8	54.1	52.4	50.1	44.9	44.7
106	Nepal	53.5	53.8	55.3	55.9	56.6	57.3	57.8	58.1	58.6
107	Netherlands	77.4	77.5	77.3	77.5	77.7	77.9	78.0	78.0	78.1
108	New Zealand	75.5	75.6	76.4	76.6	76.8	76.9	77.1	77.4	77.6
109	Nicaragua	66.7	67.1	67.3	67.5	67.7	67.9	68.1	68.1	68.4
110	Niger	46.5	46.7	47.1	47.5	48.0	48.5	48.9	44.8	45.2
111	Nigeria	50.4	50.6	51.0	54.4	52.3	50.1	50.1	51.5	51.7
112	Norway	76.9	77.0	77.5	77.6	77.8	78.1	78.3	78.4	78.5
113	Oman	69.6	69.8	70.0	70.3	70.6	70.9	71.1	70.8	71.0
114	Pakistan	61.5	61.8	62.3	62.8	63.4	64.0	64.4	59.6	60.0
115	Panama	72.8	72.9	73.2	73.4	73.5	73.6	73.8	73.9	74.0
116	Papua New Guinea	55.8	56	56.4	56.8	57.4	57.9	58.3	56.2	56.7
117	Paraguay	70.0	70.1	68.8	69.1	69.4	69.6	69.8	69.9	70.1
118	Peru	66.0	66.3	67.4	67.7	68.0	68.3	68.6	68.5	68.8
119	Philippines	66.3	66.5	67	67.4	67.9	68.3	68.6	69.0	69.3
120	Poland	71.1	71.1	71.2	71.1	71.8	72.5	72.7	73.1	73.3
121	Portugal	74.6	74.7	74.6	74.8	75.1	75.3	75.5	75.5	75.7
122	Qatar	70.5	70.6	70.9	71.1	71.4	71.7	71.9	69.3	69.6
123	Russian Federation	67.6	67.4	65.7	65.5	66.1	66.6	66.7	66.1	66.1
124	Rwanda	47.3	47.2	25.0	43.4	42.0	40.5	40.6	39.9	40.2

DATA TABLE 1: LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
12	Saint Kitts and Nevis	70.0	70.0	69.0	69.0	69.5	70.0	70.0	70.0	70.0
12	St. Vincent and the Grenadines	71.0	71.0	72.0	72.0	72.5	73.0	73.0	71.3	69.6
12	Samoa (Western)	67.6	67.8	68.1	68.4	69.9	71.3	71.7	68.9	69.2
12	Sao Tome and Principe	67.0	67.0	67.0	69.0	66.5	64.0	64.0	65.1	65.1
12	Saudi Arabia	69.7	69.9	70.3	70.7	71.1	71.4	71.7	71.3	71.6
13	Senegal	49.3	49.5	49.9	50.3	51.3	52.3	52.7	52.9	53.3
13	Seychelles	71.0	71.0	72.0	72.0	71.5	71.0	71.0	71.9	72.7
13	Sierra Leone	39.0	39.2	33.6	34.7	36.0	37.2	37.9	38.3	38.9
13	Singapore	74.8	74.9	77.1	77.1	77.1	77.1	77.3	77.4	77.6
13	Slovakia	70.9	70.9	70.8	70.9	72.0	73.0	73.1	73.1	73.3
13	Solomon Islands	70.4	70.5	70.8	71.1	71.4	71.7	71.9	70.1	68.3
13	South Africa	62.9	63.2	63.7	64.1	59.4	54.7	53.2	53.9	52.1
13	Spain	77.6	77.7	77.6	77.7	77.9	78.0	78.1	78.3	78.5
13	Sri Lanka	71.9	72.0	72.2	72.5	72.8	73.1	73.3	71.9	72.1
13	Sudan	53.0	53.2	51.0	52.2	53.6	55.0	55.4	55.6	56.0
14	Surinam	70.3	70.5	70.7	70.9	70.5	70.1	70.3	70.4	70.6
14	Swaziland	57.5	57.8	58.3	58.8	59.5	60.2	60.7	47.0	44.4
14	Sweden	78.2	78.3	78.3	78.4	78.5	78.5	78.7	79.6	79.7
14	Switzerland	78.0	78.1	78.1	78.2	78.4	78.6	78.7	78.8	78.9
14	Syrian Arab Republic	67.1	67.3	67.8	68.1	68.5	68.9	69.2	70.9	71.2
14	Tajikistan	70.2	70.4	66.8	66.9	67.1	67.2	67.5	67.4	67.6
14	Tanzania, U. Rep	52.1	52.1	50.3	50.6	49.3	47.9	47.9	51.1	51.1
14	Thailand	69.0	69.2	69.5	69.5	69.2	68.8	68.9	69.9	70.2
14	Togo	55.0	55.2	50.6	60.5	54.7	48.8	49.0	51.6	51.8
14	Trinidad and Tobago	71.6	71.7	72.9	73.1	73.5	73.8	74.0	74.1	74.3
15	Turkmenistan	65.0	65.1	64.7	64.9	65.2	65.4	65.7	65.9	66.2
15	Turkey	66.5	66.7	68.2	68.5	68.8	69.0	69.3	69.5	66.2
15	Uganda	44.9	44.7	40.2	40.5	40.1	39.6	40.7	43.2	44.0
15	Ukraine	69.4	69.3	68.4	68.5	68.7	68.8	69.1	68.1	68.1
15	United Arab Emirates	73.8	73.9	74.2	74.4	74.6	74.8	75.0	74.8	75.0
15	United Kingdom	76.2	76.3	76.7	76.8	77.0	77.2	77.3	77.5	77.7
15	United States	76.0	76.1	76.2	76.4	76.6	76.7	76.8	76.8	77.0
15	Uruguay	72.5	72.6	72.6	72.7	73.3	73.9	74.1	74.2	74.4
15	Uzbekistan	69.2	69.4	67.5	68.5	68.0	67.5	67.8	68.7	69.0
15	Vanuatu	65.2	65.4	65.9	66.3	66.9	67.4	67.7	68.0	68.0
16	Venezuela	71.7	71.8	72.1	72.3	72.4	72.4	72.6	72.7	72.9
16	Viet Nam	65.2	65.5	66.0	66.4	66.9	67.4	67.8	67.8	68.2
16	Yemen	50.2	50.4	56.2	56.7	57.4	58.0	58.5	60.1	60.6
16	Zambia	48.9	48.6	42.6	42.7	41.4	40.1	40.5	41.0	41.4
16	Zimbabwe	53.7	53.4	49.0	48.9	46.5	44.1	43.5	42.9	42.9

DATA TABLE 2: ADULT LITERACY RATE IN PERCENTAGE

	Report year	1995	1996	199	1998		1999	200	2001	2002
	Data Year	1992	1993	199	1995	1996	1997	199	1999	2000
1	Albania	85.0	83.5	85.	85.0	85.0	85.0	83.	84.0	84.7
2	Algeria	57.4	65.5	59.	81.6	71.0	60.3	65.	66.6	66.7
3	Armenia	98.8	98.2	98.	98.8	98.8	98.8	98.	98.3	98.4
4	Angola	42.5	42.0	42.	42.0	43.5	45.0	42.	42.0	42.0
5	Antigua and Barbuda	96.0	95.0	96.	95.0	95.0	95.0	95.	90.8	86.6
6	Argentina	95.9	96.7	9	96.2	96.4	96.5	96.	96.7	96.8
7	Australia	99.0	99.0	99.	99.0	99.0	99.0	99.	99.0	99.0
8	Austria	99.0	99.0	99.	99.0	99.0	99.0	99.	99.0	99.0
9	Azerbaijan	96.3	99.0	96.	96.3	96.3	96.3	99.	97.0	97.0
10	Bahamas	98.0	95.5	98.	98.2	97.0	95.8	95.	95.7	95.4
11	Bahrain	83.5	86.5	84.	85.2	85.7	86.2	86.	87.1	87.6
12	Bangladesh	36.4	40.1	37.	38.1	38.5	38.9	40.	40.8	41.3
13	Barbados	97.0	97.0	97.	97.4	97.5	97.6	97.	97.0	98.0
14	Belgium	99.0	99.0	99.	99.0	99.0	99.0	99.	99.0	99.0
15	Benin	32.9	37.7	35.	37.0	35.5	33.9	37.	39.0	37.4
16	Bhutan	39.2	42.0	41.	42.2	43.2	44.2	42.	42.0	47.0
17	Bolivia	80.7	84.4	82.	83.1	83.4	83.6	84.	85.0	85.5
18	Botswana	67.2	75.6	68.	69.8	73.6	77.4	75.	76.4	77.2
19	Brazil	81.9	84.5	82.	83.3	83.7	84.0	84.	84.9	85.2
20	Brunei Darussalam	86.4	90.7	87.	88.2	89.2	90.1	90.	91.0	91.5
21	Bulgaria	93.0	98.2	93.	98.0	98.1	98.2	98.	98.3	98.4
22	Burkina Faso	17.4	22.2	18.	19.2	20.0	20.7	22.	23.0	23.9
23	Burundi	32.9	45.8	34.	35.3	40.0	44.6	45.	46.9	48.0
24	Cameroon	59.6	73.6	62.	63.4	67.6	71.7	73.	74.8	75.8
25	Canada	99.0	99.0	99.	99.0	99.0	99.0	99.	99.0	99.0
26	Cape Verde	66.4	72.9	69.	71.6	71.3	71.0	72.	73.6	73.8
27	Central African Republic	53.9	44.0	57.	60.0	51.2	42.4	44.	45.4	46.7
28	Chad	44.9	39.4	47.	48.1	49.2	50.3	39.	41.0	42.6
29	Chile	94.5	95.4	95.	95.2	95.2	95.2	95.	95.6	95.8
30	China	79.3	82.8	80.	81.5	82.2	82.9	82.	83.5	84.1
31	Colombia	90.3	91.2	91.	91.3	91.1	90.9	91.	91.5	91.7
32	Cambodia	37.8	35.0	65.	65.0	65.5	66.0	65.	68.2	67.8
33	Comoros	55.6	58.5	56.	57.3	56.4	55.4	58.	59.2	55.9
34	Congo	70.7	78.4	73.	74.9	75.9	76.9	78.	79.5	80.7
35	Congo, Dem. Rep.	70.7	58.9	73.	74.9	76.0	77.0	58.	60.3	61.4
36	Costa Rica	94.3	95.3	94.	94.8	95.0	95.1	95.	95.5	95.6
37	Cote of Ivoire	36.6	44.5	39.	40.1	41.4	42.6	44.	45.7	46.8
38	Cuba	94.9	96.4	95.	95.7	95.8	95.9	96.	96.6	96.7
39	Cyprus	94.0	96.6	94.	94.0	95.0	95.9	96.	96.9	97.1
40	Czech Republic	99.0	99.0	99.	99.0	99.0	99.0	99.	99.0	99.0

DATA TABLE 2: ADULT LITERACY RATE IN PERCENTAGE

	Report year	1995	1996	1997	1998		1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
41	Denmark	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
42	Djibouti	43.2	44.2	45	46.2	47.3	48.3	62.3	63.4	64.6
43	Dominica	97.0	94.0	94.0	94.0	94.0	94.0	94.0	95.2	96.4
44	Dominican Republic	80.7	82.8	81.5	82.1	82.4	82.6	82.8	83.2	83.6
45	Ecuador	88.4	90.6	89.6	90.1	90.4	90.7	90.6	91.0	91.6
46	Egypt	49.1	53.7	50.5	51.4	52.1	52.7	53.7	54.6	55.3
47	El Salvador	69.8	77.8	70.9	71.5	74.3	77.0	77.8	78.3	78.7
48	Equatorial Guinea	75.3	81.1	77.8	78.5	79.2	79.9	81.1	82.2	83.2
49	Estonia	99.0	99.0	99.0	99.0	99.0	99.0	99.0	98.0	99.0
50	Ethiopia	32.7	36.3	34.5	35.5	35.5	35.4	36.3	37.4	39.1
51	Fiji	90.1	92.2	91.3	91.6	91.7	91.8	92.2	92.6	92.9
52	Finland	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
53	France	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
54	Gabon	58.9	63.0	62.6	63.2	64.7	66.2	63.0	63.0	71.0
55	Gambia	35.6	34.6	37.2	38.6	35.8	33.1	34.6	35.7	36.6
56	Georgia	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
57	Germany	99.0	99.0	99.0	99.0	99.0	99.0	99.0	98.0	99.0
58	Ghana	60.7	69.1	63.4	64.5	65.5	66.4	69.1	70.3	71.5
59	Greece	93.8	96.9	96.7	96.7	96.7	96.6	96.9	97.1	97.2
60	Grenada	98.0	96.0	98.0	98.0	97.0	96.0	96.0	95.2	94.4
61	Guatemala	54.2	67.3	55.7	65.0	65.8	66.6	67.3	68.1	68.6
62	Guinea	33.0	36.0	34.8	35.9	36.9	37.9	36.0	35.0	41.0
63	Guinea Bissau	33.0	36.7	53.9	54.9	44.3	33.6	36.7	37.7	38.5
64	Guyana	97.5	98.3	97.9	98.1	98.1	98.1	98.3	63.3	98.5
65	Haiti	42.6	47.8	44.1	45.0	45.4	45.8	47.8	52.4	49.8
66	Honduras	70.7	73.4	72.0	72.7	71.7	70.7	73.4	74.0	74.6
67	Hong Kong, China (SAR)	91.2	92.9	92.3	92.2	92.3	92.4	92.9	93.3	93.5
68	Hungary	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
69	Iceland	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
70	India	49.9	55.7	51.2	52.0	52.8	53.5	55.7	56.5	57.2
71	Indonesia	82.5	85.7	83.2	83.8	84.4	85	85.7	86.3	86.9
72	Iran, Islamic Republic of	64.9	74.6	68.6	69.0	71.2	73.3	74.6	75.7	76.3
73	Ireland	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
74	Israel	95.0	95.7	95.0	95.0	95.2	95.4	95.7	95.8	94.6
75	Italy	97.4	98.3	98.1	98.1	98.2	98.3	98.3	98.4	98.4
76	Jamaica	83.7	86.0	84.4	85.0	85.2	85.5	86.0	86.4	86.9
77	Japan	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0	99.0
78	Jordan	83.9	88.6	85.5	86.6	86.9	87.2	88.6	89.2	89.7
79	Kazakhstan	97.5	99.0	97.5	99.0	99.0	99.0	99.0	99.0	98.0
80	Kenya	74.5	80.5	77.0	78.1	78.7	79.3	80.5	81.5	82.4
81	Korea, Republic Of	97.4	97.5	97.9	98.0	97.6	97.2	97.5	97.6	97.8
82	Kuwait	76.9	80.9	77.8	78.6	79.5	80.4	80.9	81.9	82.0
83	Kyrgyz Stan	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0	97.0

DATA TABLE 2: ADULT LITERACY RATE IN PERCENTAGE

	Report year	1995	1996	1997	1998		199	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	199	1998	1999	2000
84	Lao People's Dem. Rep.	53.5	46.1	55.8	56.6	57.6	58.	46.1	47.3	48.7
85	Latvia	99.0	99.0	99.0	99.0	99.0	99.	99.0	99.0	99.0
86	Lebanon	91.4	85.1	92.0	92.4	88.4	84.	85.1	85.6	86.0
87	Lesotho	68.6	82.4	70.5	71.3	76.8	82.	82.4	82.9	83.4
88	Libyan Arab Jamahiriya	72.4	78.1	75.0	76.2	76.4	76.	78.1	79.1	80.0
89	Lithuania	98.4	99.5	98.4	99.0	99.0	99.	99.5	99.0	99.6
90	Luxembourg	99.0	99.0	99.0	99.0	99.0	99.	99.0	99.0	99.0
91	Madagascar	81.4	64.9	45.8	45.8	46.4	47.	64.9	65.7	66.5
92	Malawi	53.9	58.2	55.8	56.4	57.1	57.	58.2	59.2	60.1
93	Malaysia	81.5	86.4	83.0	83.5	84.6	85.	86.4	87.0	87.5
94	Maldives	92.6	96.0	93.0	93.2	94.5	95.	96.0	99.6	96.7
95	Mali	27.2	38.2	29.3	31.0	33.3	35.	38.2	39.8	41.5
96	Malta	87.0	91.5	86.0	91.0	91.1	91.	91.5	91.8	78.0
97	Mauritania	36.2	41.2	36.9	37.7	38.1	38.	41.2	41.6	40.2
98	Mauritius	81.1	83.8	82.4	82.9	83.0	83.	83.8	84.2	84.5
99	Mexico	88.6	90.8	89.2	89.6	89.9	90.	90.8	91.1	91.4
100	Moldova, Republic of	96.0	98.6	98.9	98.9	98.6	98.	98.6	98.7	98.9
101	Mongolia	81.1	83.0	82.2	82.9	83.5	84.	83.0	62.3	98.9
102	Morocco	40.6	47.1	41.1	43.7	44.8	45.	47.1	48.0	48.9
103	Mozambique	36.9	42.3	39.5	40.1	40.3	40.	42.3	43.2	39.3
104	Myanmar	82.0	84.1	82.7	83.1	83.4	83.	84.1	84.4	84.7
105	Namibia	40.0	40.0	40.0	76.0	77.9	79.	80.8	81.4	82.0
106	Nepal	25.6	39.2	27.0	27.5	32.8	38.	39.2	40.4	41.8
107	Netherlands	99.0	99.0	99.0	99.0	99.0	99.	99.0	99.0	99.0
108	New Zealand	99.0	99.0	99.0	99.0	99.0	99.	99.0	99.0	99.0
109	Nicaragua	64.7	67.9	65.3	65.7	64.6	63.	67.9	68.2	66.5
110	Niger	12.4	14.7	13.1	13.6	14.0	14.	14.7	15.3	15.9
111	Nigeria	52.5	61.1	55.6	57.1	58.3	59.	61.1	62.6	63.9
112	Norway	99.0	99.0	99.0	99.0	99.0	99.	99.0	99.0	99.0
113	Oman	35.0	35.0	35.0	59.0	63.1	67.	68.8	70.3	71.7
114	Pakistan	35.7	36.4	37.1	37.8	39.4	40.	44.0	45.0	43.2
115	Panama	89.6	91.4	90.5	90.8	91.0	91.	91.4	91.7	91.9
116	Papua New Guinea	69.7	63.2	71.2	72.2	73.0	73.	63.2	63.9	63.9
117	Paraguay	91.2	92.8	91.9	92.1	92.3	92.	92.8	93.0	93.3
118	Peru	87.3	89.2	88.3	88.7	88.7	88.	89.2	89.6	89.9
119	Philippines	94.0	94.8	94.4	94.6	94.6	94.	94.8	95.1	95.3
120	Poland	99.0	99.0	99.0	99.0	99.0	99.	99.0	99.0	99.0
121	Portugal	86.2	91.4	89.6	89.6	90.2	90.	91.4	91.9	92.2
122	Qatar	78.1	80.4	78.9	79.4	79.7	80.	80.4	80.8	81.2
123	Russian Federation	98.7	99.0	98.7	99.0	99.0	99.	99.0	99.0	99.0
124	Rwanda	56.8	64.0	59.2	54.9	59.0	63.	64.0	65.8	66.8

DATA TABLE 2: ADULT LITERACY RATE IN PERCENTAGE

	Report year	1995	1996	199	1998		1999	2000	2001	2002
	Data Year	1992	1993	199	1995	1996	1997	1998	1999	2000
125	Saint Kitts and Nevis	99.0	90.0	90.	90.0	90.0	90.0	90.0	93.9	97.8
126	St. Vincent and the Grenadines	98.0	82.0	82.	82.0	82.0	82.0	82.0	85.5	88.9
127	Samoa (Western)	98.0	98.0	98.	98.0	98.0	98.0	79.7	73.6	80.2
128	Sao Tome and Principe	60.0	60.0	67.	75.0	75.0	75.0	57.0	70.1	83.1
129	Saudi Arabia	60.6	61.3	61.	63.0	68.2	73.4	75.2	76.1	76.3
130	Senegal	30.5	35.5	32.	33.1	33.9	34.6	35.5	36.4	37.3
131	Seychelles	77.0	84.0	88.	88.0	86.0	84.0	84.0	86.0	88.0
132	Sierra Leone	28.7	31.0	30.	31.4	32.4	33.3	31.0	32.0	36.0
133	Singapore	89.9	91.8	91.	91.1	91.3	91.4	91.8	92.1	92.3
134	Slovakia	99.0	99.0	99.	99.0	99.0	99.0	99.0	99.0	99.0
135	Solomon Islands	24.0	62.0	62.	62.0	62.0	62.0	62.0	69.3	76.6
136	South Africa	80.6	84.6	81.	81.8	82.9	84.0	84.6	84.9	85.3
137	Spain	98.0	97.4	97.	97.1	97.2	97.2	97.4	97.6	97.6
138	Sri Lanka	89.3	91.1	90.	90.2	90.5	90.7	91.1	91.4	91.6
139	Sudan	42.7	55.7	44.	46.1	49.7	53.3	55.7	56.9	57.8
140	Surinam	92.2	93.0	92.	93.0	93.3	93.5	93.0	93.0	94.0
141	Swaziland	74.0	78.3	75.	76.7	77.1	77.5	78.3	78.9	79.6
142	Sweden	99.0	99.0	99.	99.0	99.0	99.0	99.0	99.0	99.0
143	Switzerland	99.0	99.0	99.	99.0	99.0	99.0	99.0	99.0	99.0
144	Syrian Arab Republic	67.7	72.7	69.	70.8	71.2	71.6	72.7	73.6	74.4
145	Tajikistan	96.7	99.0	96.	99.0	99.0	98.9	99.0	99.0	99.2
146	Tanzania, U. Rep	64.4	73.6	66.	67.8	69.7	71.6	73.6	74.7	75.1
147	Thailand	93.5	95.0	93.	93.8	94.3	94.7	95.0	95.3	95.5
148	Togo	47.9	55.2	50.	51.7	52.5	53.2	55.2	56.3	57.1
149	Trinidad and Tobago	97.4	93.4	97.	97.9	97.9	97.8	93.4	74.1	93.8
150	Turkmenistan	97.7	98.0	97.	98.0	98.0	98.0	98.0	98.0	98.0
151	Turkey	80.5	84.0	81.	82.3	82.8	83.2	84.0	84.6	85.1
152	Uganda	58.6	65.0	61.	61.8	62.9	64.0	65.0	66.1	67.1
153	Ukraine	95.0	99.0	98.	98.0	98.5	99.0	99.0	99.0	99.0
154	United Arab Emirates	77.7	74.6	78.	79.2	77.0	74.8	74.6	75.1	76.3
155	United Kingdom	99.0	99.0	99.	99.0	99.0	99.0	99.0	99.0	99.0
156	United States	99.0	99.0	99.	99.0	99.0	99.0	99.0	99.0	99.0
157	Uruguay	96.9	97.6	97.	97.3	97.4	97.5	97.6	97.7	97.7
158	Uzbekistan	97.2	88.0	97.	98.0	98.5	99.0	88.0	88.5	99.0
159	Vanuatu	65.0	64.0	64.	64.0	64.0	64.0	64.0	34.0	34.0
160	Venezuela	90.4	92.0	91.	91.1	91.6	92.0	92.0	92.3	92.6
161	Viet Nam	91.9	92.9	93.	93.7	92.8	91.9	92.9	93.1	93.4
162	Yemen	41.1	44.1	41.	38.0	40.3	42.5	44.1	45.2	46.3
163	Zambia	75.2	76.3	76.	78.2	76.7	75.1	76.3	77.2	82.0
164	Zimbabwe	83.4	87.2	84.	85.1	88.0	90.9	87.2	88.0	88.7

DATA TABLE 3: COMBINED ENROLMENT RATIO IN PERCENTAGE

	Report year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	1999
1	Albania	69	59	59	59	63.5	68	69	71	71
2	Algeria	66	66	66	66	67	68	69	72	72
3	Armenia	78	78	78	78	75	72	72	80	80
4	Angola	33	32	31	30	28.5	27	25	23	23
5	Antigua and Barbuda	76	76	76	76	76	76	78	69	69
6	Argentina	79	80	77	79	79	79	80	83	83
7	Australia	79	79	79	79	89.5	100	100	100	100
8	Austria	84	85	87	87	86.5	86	86	90	90
9	Azerbaijan	68	72	72	72	71.5	71	72	71	71
10	Bahamas	74	75	75	72	73	74	74	74	74
11	Bahrain	84	84	85	84	82.5	81	81	80	80
12	Bangladesh	38	40	39	37	36	35	36	37	37
13	Barbados	74	78	76	77	78.5	80	80	77	77
14	Belgium	84	85	86	86	93	100	100	100	100
15	Benin	34	34	35	38	40	42	43	45	45
16	Bhutan	31	31	31	31	31	31	33	33	33
17	Bolivia	66	68	66	69	69.5	70	70	70	70
18	Botswana	71	71	71	71	70.5	70	71	70	70
19	Brazil	70	72	72	72	76	80	84	80	80
20	Brunei Darussalam	68	70	70	74	73	72	72	91	91
21	Bulgaria	67	65	66	66	68	70	73	72	72
22	Burkina Faso	19	19	20	19	19.5	20	22	23	23
23	Burundi	31	31	31	23	23	23	22	19	19
24	Cambodia	30	30	58	62	61.5	61	61	62	62
25	Cameroon	50	48	46	45	44	43	46	43	43
26	Canada	100	100	100	100	99.5	99	100	97	97
27	Cape Verde	59	62	64	64	70.5	77	78	77	77
28	Central African Republic	37	37	37	27	26.5	26	26	24	24
29	Chad	28	27	25	27	28	29	32	31	31
30	Chile	71	71	72	73	75	77	78	78	78
31	China	55	57	58	64	66.5	69	72	73	73
32	Colombia	67	68	70	69	70	71	71	73	73
33	Comoros	37	38	39	39	39	39	39	36	36
34	Congo	56	56	56	68	68	68	65	63	63
35	Congo, Dem. Rep. Of	56	56	56	68	53.5	39	33	32	32
36	Costa Rica	66	68	68	69	67.5	66	66	67	67
37	Cote of Ivoire	39	39	39	38	39	40	41	38	38
38	Cuba	65	65	63	66	69	72	73	76	76
39	Cyprus	75	76	75	79	79	79	81	69	69
40	Czech Republic	68	67	70	70	72	74	74	70	70

DATA TABLE 3: COMBINED ENROLMENT RATIO IN PERCENTAGE

	Report year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	1999
41	Denmark	84	87	89	89	89	89	93	97	97
42	Djibouti	18	19	20	20	20.5	21	21	22	22
43	Dominica	77	64	77	77	77	77	74	65	65
44	Dominican Republic	72	64	68	73	69.5	66	70	72	72
45	Ecuador	71	72	72	71	72	73	75	77	77
46	Egypt	67	69	69	69	70.5	72	74	76	76
47	El Salvador	54	54	55	58	61	64	64	63	63
48	Equatorial Guinea	60	60	64	64	64	64	65	64	64
49	Estonia	70	78	72	72	76.5	81	86	86	86
50	Ethiopia	14	16	18	20	22	24	26	27	27
51	Fiji	78	79	79	78	79	80	81	84	84
52	Finland	96	96	97	97	98	99	101	100	100
53	France	86	88	89	89	90.5	92	93	94	94
54	Gabon	47	47	60	60	60	60	63	86	86
55	Gambia	33	34	34	39	40	41	41	45	45
56	Georgia	78	68	69	69	70	71	72	70	70
57	Germany	81	79	81	81	84.5	88	90	94	94
58	Ghana	45	45	44	44	43	42	43	42	42
59	Greece	78	78	82	82	80.5	79	81	81	81
60	Grenada	78	78	78	78	78	78	76	65	65
61	Guatemala	43	45	46	46	46.5	47	47	49	49
62	Guinea	22	24	24	25	26.5	28	29	28	28
63	Guinea Bissau	22	30	29	29	31.5	34	34	37	37
64	Guyana	68	70	67	64	64	64	66	66	66
65	Haiti	30	30	29	29	26.5	24	24	52	52
66	Honduras	59	61	60	60	59	58	58	61	61
67	Hong Kong, China (SAR)	70	71	72	67	66	65	64	63	63
68	Hungary	67	67	67	67	70.5	74	75	81	81
69	Iceland	81	82	83	83	85	87	89	89	89
70	India	55	55	56	55	55	55	54	56	56
71	Indonesia	60	61	62	62	63	64	65	65	65
72	Iran, Islamic Republic of	68	67	68	67	69.5	72	69	73	73
73	Ireland	83	84	88	88	88	88	91	91	91
74	Israel	77	76	75	75	77.5	80	81	83	83
75	Italy	70	70	73	73	77.5	82	83	84	84
76	Jamaica	65	64	65	67	65	63	63	62	62
77	Japan	77	78	78	78	81.5	85	85	82	82
78	Jordan	66	66	66	66	66	66	69	55	55
79	Kazakhstan	67	65	73	73	74.5	76	77	77	77
80	Kenya	57	56	55	52	51	50	50	51	51
81	Korea, Republic Of	79	81	82	83	86.5	90	90	90	90
82	Kuwait	47	53	57	58	57.5	57	58	59	59
83	Kyrgyz Stan	77	70	73	73	71	69	70	68	68

DATA TABLE 3: COMBINED ENROLMENT RATIO IN PERCENTAGE

	Report year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	1999
84	Lao People's Dem. Rep.	48	50	50	50	52.5	55	57	58	58
85	Latvia	68	72	67	67	69	71	75	82	82
86	Lebanon	73	74	75	75	75.5	76	77	78	78
87	Lesotho	57	55	56	56	57	58	57	61	61
88	Libyan Arab Jamahiriya	66	88	91	90	91	92	92	92	92
89	Lithuania	67	72	70	70	72.5	75	77	80	80
90	Luxembourg	56	57	58	58	63.5	69	69	73	73
91	Madagascar	35	34	33	31	35	39	40	44	44
92	Malawi	46	47	67	76	75.5	75	75	73	73
93	Malaysia	60	61	62	61	63	65	65	87	87
94	Maldives	66	70	71	71	72.5	74	75	77	77
95	Mali	15	16	17	18	21.5	25	26	28	28
96	Malta	75	76	76	76	77	78	79	80	80
97	Mauritania	32	35	36	38	39.5	41	42	41	41
98	Mauritius	59	60	61	61	62	63	63	63	63
99	Mexico	65	65	66	67	68.5	70	70	71	71
100	Moldova, Republic of	76	76	67	67	68.5	70	70	72	72
101	Mongolia	60	62	52	53	54	55	57	58	58
102	Morocco	43	44	46	48	48.5	49	50	52	52
103	Mozambique	25	25	25	25	25	25	25	23	23
104	Myanmar	47	49	48	48	51.5	55	56	55	55
105	Namibia	81	83	84	83	82.5	82	84	78	78
106	Nepal	55	57	55	58	58.5	59	61	60	60
107	Netherlands	88	89	91	91	94.5	98	99	100	100
108	New Zealand	85	89	94	94	94.5	95	96	99	99
109	Nicaragua	61	61	62	64	63.5	63	63	63	63
110	Niger	14	15	15	15	15	15	15	16	16
111	Nigeria	51	52	50	49	51.5	54	43	45	45
112	Norway	88	90	92	92	93.5	95	97	97	97
113	Oman	59	60	60	60	59	58	58	58	58
114	Pakistan	25	37	38	41	42	43	43	40	40
115	Panama	68	69	70	72	72.5	73	73	74	74
116	Papua New Guinea	34	35	38	37	37	37	37	39	39
117	Paraguay	59	62	62	63	63.5	64	65	64	64
118	Peru	79	80	81	79	78.5	78	79	80	80
119	Philippines	77	77	78	80	81	82	83	82	82
120	Poland	75	76	79	79	78	77	79	84	84
121	Portugal	77	79	81	81	86	91	93	96	96
122	Qatar	75	74	73	71	71	71	74	75	75
123	Russian Federation	69	79	78	78	77.5	77	79	78	78
124	Rwanda	39	39	37	29	36	43	43	40	40

DATA TABLE 3: COMBINED ENROLMENT RATIO IN PERCENTAGE

	Report year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	1999
125	Saint Kitts and Nevis	78	78	78	78	78	78	79	70	70
126	Saint Vincent & the Grenadines	78	78	78	78	78	78	68	58	58
127	Samoa (Western)	78	74	74	74	70	66	65	65	65
128	Sao Tome and Principe	48	57	57	57	57	57	57	58	58
129	Saudi Arabia	52	55	56	57	56.5	56	57	61	61
130	Senegal	31	31	31	33	34	35	36	36	36
131	Seychelles	61	61	61	61	61	61	76	88	88
132	Sierra Leone	28	28	28	30	30	30	24	27	27
133	Singapore	68	68	72	68	70.5	73	73	75	75
134	Slovakia	71	71	72	72	73.5	75	75	76	76
135	Solomon Islands	44	46	47	47	46.5	46	46	50	50
136	South Africa	76	78	81	81	87	93	95	93	93
137	Spain	86	87	90	90	91	92	94	95	95
138	Sri Lanka	66	66	66	67	66.5	66	66	70	70
139	Sudan	31	31	31	32	33	34	34	34	34
140	Suriname	71	71	71	71	71	71	80	83	83
141	Swaziland	70	70	72	77	75	73	72	82	82
142	Sweden	78	80	82	82	91	100	100	100	100
143	Switzerland	74	75	76	76	77.5	79	80	72	72
144	Syrian Arab Republic	67	65	64	62	61	60	59	63	63
145	Tajikistan	67	69	69	69	69	69	69	67	67
146	Tanzania, U. Rep. Of	34	34	34	33	33	33	33	32	32
147	Thailand	53	54	53	55	57	59	61	60	60
148	Togo	60	51	50	60	60.5	61	62	62	62
149	Trinidad and Tobago	68	67	67	65	65.5	66	66	65	65
150	Turkmenistan	77	77	90	90	90	90	72	81	81
151	Turkey	61	62	63	60	60.5	61	61	62	62
152	Uganda	37	35	34	38	39	40	41	45	45
153	Ukraine	70	76	76	76	76.5	77	78	77	77
154	United Arab Emirates	80	81	82	69	69	69	70	68	68
155	United Kingdom	77	83	86	86	93	100	100	100	100
156	United States	95	96	96	96	95	94	94	95	95
157	Uruguay	77	76	75	76	76.5	77	78	79	79
158	Uzbekistan	77	73	73	76	76	76	77	76	76
159	Vanuatu	52	52	52	52	49.5	47	47	76	76
160	Venezuela	71	69	68	67	67	67	67	65	65
161	Viet Nam	49	51	55	55	58.5	62	63	67	67
162	Yemen	44	45	52	49	49	49	49	51	51
163	Zambia	49	49	48	52	50.5	49	49	49	49
164	Zimbabwe	70	70	68	69	68.5	68	68	65	65

DATA TABLE 4: GROSS DOMESTIC PRODUCT PER CAPITA IN PPPS

	Report Year	1995	1996	1997	1998	****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	**	1997	1998	1999	2000
1	Albania	3500	2200	2788	2853	2487	2120	2804	3,189	3506
2	Algeria	4870	5570	5442	5618	5039	4460	4792	5,063	5308
3	Armenia	2420	2040	1737	2208	2284	2360	2072	2,215	2559
4	Angola	751	674	1600	1839	1635	1430	1821	3,179	2187
5	Antigua and Barbuda	4436	5369	8977	9131	9412	9692	9277	9909	10541
6	Argentina	8860	8350	8937	8498	9399	10300	12013	12277	12377
7	Australia	18220	18530	19285	19632	19921	20210	22452	24574	25693
8	Austria	18710	19115	20667	21322	21696	22070	23166	25089	26765
9	Azerbaijan	2550	2190	1670	1463	1507	1550	2175	2,850	2936
10	Bahamas	17360	16180	15875	15738	16222	16705	14614	15258	17012
11	Bahrain	14590	15500	15321	16751	16639	16527	13111	13688	15084
12	Bangladesh	1230	1290	1331	1382	1216	1050	1361	1,483	1602
13	Barbados	9667	10570	11051	11306	11654	12001	12001	14353	15494
14	Belgium	18630	19540	20985	21548	22149	22750	23223	25443	27178
15	Benin	1630	1650	1696	1800	1535	1270	867	933	990
16	Bhutan	750	790	1289	1382	1425	1467	1536	1474	1412
17	Bolivia	2410	2510	2598	2617	2749	2880	2269	2,355	2424
18	Botswana	5120	5220	5367	5611	6651	7690	6103	6,872	7184
19	Brazil	5240	5500	5362	5928	6204	6480	6625	7,037	7625
20	Brunei Darussalam	20589	18414	30447	31165	30469	29773	16765	17868	16779
21	Bulgaria	4250	4320	4533	4604	4307	4010	4809	5,071	5710
22	Burkina Faso	810	780	796	784	897	1010	870	965	976
23	Burundi	720	670	698	637	633.5	630	570	578	591
24	Cambodia	1250	1250	1084	1110	1200	1290	1257	1,361	1446
25	Cameroon	2390	2220	2120	2355	2123	1890	1474	1,573	1703
26	Canada	20520	20950	21459	21916	22198	22480	23582	26251	27840
27	Cape Verde	1750	1820	1862	2612	2801	2990	3233	4,490	4863
28	Central African Republic	1130	1050	1130	1092	1211	1330	1118	1,166	1172
29	Chad	760	690	700	1172	1071	970	856	850	871
30	Chile	8410	8900	9129	9930	11330	12730	8787	8652	9417
31	China	1950	2330	2604	2935	3033	3130	3105	3,617	3976
32	Colombia	5480	5790	6107	6347	6579	6810	6006	5,749	6248
33	Comoros	1350	1130	1366	1317	1424	1530	1398	1,429	1588
34	Congo	2870	2750	2410	2554	2087	1620	995	727	825
35	Congo, Dem. Rep.	2870	2750	2410	2554	1717	880	822	801	825
36	Costa Rica	5480	5660	5919	5969	6310	6650	5987	8860	8650
37	Cote of Ivoire	1710	1620	1668	1731	1786	1840	1598	1,654	1630
38	Cuba	3412	3000	3000	3100	3100	3100	3967	4243	4519
39	Cyprus	15050	14060	13071	13379	13790	14201	17482	19006	20824
40	Czech Republic	7690	8430	9201	9775	10143	10510	12362	13018	13991

DATA TABLE 4: GROSS DOMESTIC PRODUCT PER CAPITA IN PPPS

	Report Year	1995	1996	1997	1998*	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
41	Denmark	19080	20200	21341	21983	22837	23690	24218	25869	27627
42	Djibouti	1547	775	1270	1300	1283	1266	1266	2,377	2377
43	Dominica	3526	3690	6118	6424	5372	4320	5102	5491	5880
44	Dominican Republic	3280	3690	3933	3923	4372	4820	4598	5,507	6033
45	Ecuador	4350	4400	4626	4602	4771	4940	3003	2,994	3203
46	Egypt	3540	3800	3846	3829	3440	3050	3041	3,420	3635
47	El Salvador	2250	2360	2417	2610	2745	2880	4036	4,344	4497
48	Equatorial Guinea	700	1800	1673	1712	1765	1817	1817	4,676	15073
49	Estonia	6690	3610	4294	4062	4651	5240	7682	8355	10066
50	Ethiopia	330	420	427	455	482.5	510	574	628	668
51	Fiji	5410	5530	5763	6159	5075	3990	4231	4,799	4668
52	Finland	16270	16320	17417	18547	19349	20150	20847	23096	24996
53	France	19510	19140	20510	21176	21603	22030	21175	22897	24223
54	Gabon	3913	3861	3641	3766	5658	7550	6353	6,024	6237
55	Gambia	1260	1190	939	948	1209	1470	1453	1,580	1649
56	Georgia	2300	1750	1585	1398	1679	1960	3353	2,431	2664
57	Germany	21120	18840	19675	20370	20815	21260	22169	23742	25103
58	Ghana	2110	2000	1960	2032	1836	1640	1735	1,881	1964
59	Greece	8310	8950	11265	11636	12203	12769	13943	15414	16501
60	Grenada	3822	3118	5137	5425	5145	4864	5838	13418	7580
61	Guatemala	3330	3400	3208	3682	3891	4100	3505	3,674	3821
62	Guinea	592	1800	1103	1139	1510	1880	1782	1,934	990
63	Guinea Bissau	592	860	793	811	836	861	616	678	755
64	Guyana	1800	2140	2729	3205	3208	3210	3403	3,640	3963
65	Haiti	1046	1050	896	917	1094	1270	1383	1,464	1467
66	Honduras	2000	2100	2050	1977	2099	2220	2433	2,340	2453
67	Hong Kong, China (SAR)	20340	21560	22310	22950	23650	24350	20763	22090	25153
68	Hungary	6580	6059	6437	6793	6997	7200	10232	11430	12416
69	Iceland	17660	18640	20566	21064	21781	22497	25110	27835	29581
70	India	1230	1240	1348	1422	1546	1670	2077	2,248	2358
71	Indonesia	2950	3270	3740	3971	3731	3490	2651	2,857	3043
72	Iran, Islamic Republic of	5420	5380	5766	5480	5649	5817	5121	5,531	5884
73	Ireland	12830	15120	16061	17590	19150	20710	21482	25918	29866
74	Israel	14700	15130	16023	16699	17425	18150	17301	18440	20131
75	Italy	18090	18160	19363	20174	20232	20290	20585	22172	23626
76	Jamaica	3200	3180	3816	3801	3621	3440	3389	3,561	3639
77	Japan	20520	20660	21581	21930	23000	24070	23257	24898	26755
78	Jordan	4270	4380	4187	4187	3819	3450	3347	3,955	3966
79	Kazakhstan	4270	3710	3284	3037	3299	3560	4378	2,573	5871
80	Kenya	1400	1400	1404	1438	1314	1190	980	1,022	1022
81	Korea, Republic Of	9250	9710	10656	11594	12592	13590	13478	15712	17380
82	Kuwait	8326	21630	21875	23848	24581	25314	25314	17289	15799
83	Kyrgyz Stan	2850	2320	1930	1927	2089	2250	2317	4,951	2711

DATA TABLE 4: GROSS DOMESTIC PRODUCT PER CAPITA IN PPPS

	Report Year	1995	1996	1997	1998*	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
84	Lao People's Dem. Rep.	1760	1458	2484	2571	1936	1300	1734	1,471	1575
85	Latvia	6060	5010	3332	3273	3607	3940	5728	6,264	7045
86	Lebanon	2500	2500	4863	4977	5459	5940	4326	4,705	4308
87	Lesotho	1060	980	1109	1290	1575	1860	1626	1,854	2031
88	Libyan Arab Jamahiriya	9782	6125	6125	6309	6503	6697	6697	7,570	7570
89	Lithuania	3700	3110	4011	3843	4032	4220	6436	6,656	7106
90	Luxembourg 50061	21520	25390	34155	34004	32434	30863	33505	40000	40000
91	Madagascar	710	700	694	673	801.5	930	756	799	840
92	Malawi	820	710	694	773	741.5	710	523	586	615
93	Malaysia	7790	8360	8865	9572	8856	8140	8137	8,209	9068
94	Maldives	1200	2200	2200	3540	3615	3690	4083	4,423	4485
95	Mali	550	530	543	565	652.5	740	681	753	797
96	Malta	8281	11570	13009	13316	13248	13180	16447	15189	17273
97	Mauritania	1650	1610	1593	1622	1676	1730	1563	1,609	1677
98	Mauritius	11700	12510	13172	13294	11302	9310	8312	9,107	10017
99	Mexico	7300	7010	7384	6769	7570	8370	7704	8,297	9023
100	Moldova, Republic of	3670	2370	1576	1547	1524	1500	1947	2,037	2109
101	Mongolia	2389	2090	3766	3916	2613	1310	1541	1,711	1783
102	Morocco	3370	3270	3681	3477	3394	3310	3305	3,419	3546
103	Mozambique	380	640	986	959	850	740	782	861	854
104	Myanmar	751	650	1051	1130	1165	1199	1199	1,027	1027
105	Namibia	4020	3710	4027	4054	4532	5010	5176	5,468	6431
106	Nepal	1170	1000	1137	1145	1118	1090	1157	1,237	1327
107	Netherlands	17780	17340	19238	19876	20493	21110	22176	24215	25657
108	New Zealand	14990	16720	16851	17267	17339	17410	17288	19104	20070
109	Nicaragua	2790	2280	1580	1837	1917	1997	2142	2,279	2366
110	Niger	820	790	787	765	808	850	739	753	746
111	Nigeria	1560	1540	1351	1270	1095	920	795	853	896
112	Norway	18580	20370	21346	22427	23439	24450	26342	28433	29918
113	Oman	11710	10420	10078	9383	9672	9960	9960	13,356	13356
114	Pakistan	2390	2160	2154	2209	1885	1560	1715	1,834	1928
115	Panama	5600	5890	6104	6258	6713	7168	5249	5,875	6000
116	Papua New Guinea	2410	2530	2821	2500	2577	2654	2359	2,367	2280
117	Paraguay	3390	3340	3531	3583	3782	3980	4288	4,384	4426
118	Peru	3300	3320	3645	3940	4310	4680	4282	4,622	2664
119	Philippines	2550	2590	2681	2767	3144	3520	3555	3,805	3971
120	Poland	4830	4702	5002	5442	5981	6520	7619	8450	9051
121	Portugal	9850	10720	12326	12674	13472	14270	14701	16064	17290
122	Qatar	22380	22910	18403	19772	20380	20987	20987	18789	18789
123	Russian Federation	6140	4760	4828	4531	4451	4370	6460	7,473	8377
124	Rwanda	710	740	352	811	736	660	660	885	943

DATA TABLE 4: GROSS DOMESTIC PRODUCT PER CAPITA IN PPP\$

	Report Year	1995	1996	1997	1998	****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	**	1997	1998	1999	2000
125	Saint Kitts and Nevis	5938	9340	9436	10150	9084	8017	10672	11591	12510
126	Saint Vincent & the Grenadines	3322	3552	5650	5969	5110	4250	4692	5124	5555
127	Samoa (Western)	1869	3000	2726	2948	3249	3550	3832	4,047	5041
128	Sao Tome and Principe	600	600	1704	1744	1798	1851	1469	3261	1792
129	Saudi Arabia	9880	12600	9338	8516	9318	10120	10158	10,815	11367
130	Senegal	1750	1710	1596	1815	1773	1730	1307	1,419	1510
131	Seychelles	5619	4960	7891	7697	7934	8171	10600	23108	12508
132	Sierra Leone	880	860	643	625	518	410	458	448	490
133	Singapore	18330	19350	20987	22604	25532	28460	24210	20767	23356
134	Slovakia	6690	5620	6389	7320	7615	7910	9699	10591	11243
135	Solomon Islands	2616	2266	2118	2230	2270	2310	1940	1794	1648
136	South Africa	3799	3127	4291	4334	5857	7380	8488	8,908	9401
137	Spain	13400	13660	14324	14789	15360	15930	16212	18079	19472
138	Sri Lanka	2850	3030	3277	3408	2949	2490	2979	3,279	3530
139	Sudan	1620	1350	1084	1110	1335	1560	1394	664	1797
140	Suriname	3730	3670	4711	4862	5012	5161	5161	4,178	3799
141	Swaziland	1700	2940	2821	2954	3152	3350	3816	3,987	4492
142	Sweden	18320	17900	18540	19297	19544	19790	20659	22636	24277
143	Switzerland	22580	22720	24967	24881	25061	25240	25512	27171	28769
144	Syrian Arab Republic	4960	4196	5397	5374	4312	3250	2892	4,454	3556
145	Tajikistan	1740	1380	1117	943	1035	1126	1041	1,031	1152
146	Tanzania, U. Rep. Of	620	630	656	636	608	580	480	501	523
147	Thailand	5950	6350	7104	7742	7216	6690	5456	6,132	6402
148	Togo	1220	1020	1109	1167	1329	1490	1372	1,410	1442
149	Trinidad and Tobago	9760	8670	9124	9437	8139	6840	7485	8176	8964
150	Turkmenistan	3400	3128	3469	2345	2227	2109	2550	3,347	3956
151	Turkey	5230	4210	5193	5516	5933	6350	6422	6,380	6974
152	Uganda	860	910	1370	1483	1322	1160	1074	1,167	1208
153	Ukraine	5010	3250	2718	2361	2276	2190	3194	3,458	3816
154	United Arab Emirates	21830	20940	16000	18008	18562	19115	17719	18120	17935
155	United Kingdom	17160	17230	18620	19302	20016	20730	20336	22093	23509
156	United States	23760	24680	26397	26977	27994	29010	29605	31872	34142
157	Uruguay	6070	6550	6752	6854	8027	9200	8623	8879	9035
158	Uzbekistan	2650	2510	2438	2361	2445	2529	2053	2,251	2441
159	Vanuatu	1956	2500	2276	2507	2994	3480	3120	5922	2802
160	Venezuela	8520	8360	8120	8090	8475	8860	5808	5,495	5794
161	Viet Nam	1010	1040	1208	1236	1433	1630	1689	1,860	1996
162	Yemen	2410	1600	805	856	833	810	719	806	893
163	Zambia	1230	1110	962	986	973	960	719	756	780

INDICATOR TABLE 1: INDEX OF LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	199	1998*****	1999	2000	2001	2002	
	Data Year	1992	1993	199	1995	1996	1997	1998	1999	2000
1	Albania	0.783	0.783	0.75	0.760	0.780	0.797	0.798	0.800	0.803
2	Algeria	0.702	0.705	0.71	0.718	0.730	0.732	0.737	0.738	0.743
3	Armenia	0.793	0.797	0.76	0.765	0.760	0.758	0.762	0.795	0.798
4	Angola	0.358	0.363	0.37	0.373	0.370	0.358	0.367	0.333	0.337
5	Antigua and Barbuda	0.817	0.817	0.81	0.833	0.830	0.833	0.850	0.878	0.905
6	Argentina	0.785	0.787	0.79	0.793	0.800	0.798	0.802	0.803	0.807
7	Australia	0.877	0.880	0.88	0.887	0.890	0.887	0.888	0.897	0.898
8	Austria	0.853	0.855	0.86	0.862	0.860	0.867	0.868	0.882	0.885
9	Azerbaijan	0.760	0.762	0.76	0.768	0.760	0.748	0.752	0.772	0.777
10	Bahamas	0.802	0.803	0.79	0.803	0.810	0.813	0.817	0.737	0.737
11	Bahrain	0.777	0.778	0.78	0.787	0.790	0.798	0.802	0.802	0.805
12	Bangladesh	0.510	0.515	0.52	0.532	0.540	0.552	0.560	0.565	0.573
13	Barbados	0.843	0.845	0.84	0.850	0.850	0.857	0.858	0.860	0.863
14	Belgium	0.857	0.858	0.86	0.865	0.870	0.870	0.872	0.887	0.890
15	Benin	0.377	0.380	0.48	0.490	0.480	0.473	0.475	0.477	0.480
16	Bhutan	0.428	0.433	0.44	0.450	0.520	0.595	0.603	0.608	0.617
17	Bolivia	0.573	0.578	0.58	0.592	0.600	0.607	0.613	0.617	0.623
18	Botswana	0.665	0.670	0.45	0.445	0.410	0.373	0.353	0.282	0.255
19	Brazil	0.688	0.692	0.69	0.693	0.700	0.697	0.700	0.708	0.712
20	Brunei Darussalam	0.82	0.822	0.83	0.835	0.840	0.842	0.845	0.845	0.848
21	Bulgaria	0.770	0.770	0.76	0.770	0.770	0.768	0.772	0.763	0.763
22	Burkina Faso	0.373	0.375	0.35	0.355	0.340	0.323	0.328	0.352	0.362
23	Burundi	0.420	0.422	0.30	0.325	0.310	0.290	0.295	0.260	0.260
24	Cambodia	0.443	0.448	0.45	0.465	0.470	0.473	0.475	0.523	0.523
24	Cameroon	0.517	0.522	0.50	0.505	0.500	0.495	0.492	0.417	0.417
25	Canada	0.873	0.875	0.90	0.902	0.900	0.900	0.902	0.895	0.897
26	Cape Verde	0.662	0.665	0.67	0.678	0.710	0.732	0.737	0.740	0.745
27	Central African Republic	0.407	0.408	0.38	0.390	0.360	0.332	0.330	0.322	0.322
28	Chad	0.375	0.378	0.36	0.370	0.370	0.370	0.375	0.342	0.345
29	Chile	0.813	0.815	0.83	0.835	0.830	0.832	0.835	0.837	0.838
30	China	0.725	0.727	0.73	0.737	0.740	0.747	0.752	0.753	0.758
31	Colombia	0.738	0.740	0.75	0.755	0.760	0.757	0.762	0.765	0.770
33	Comoros	0.517	0.520	0.51	0.525	0.540	0.563	0.570	0.573	0.580
34	Congo	0.438	0.437	0.43	0.437	0.420	0.393	0.398	0.435	0.438
35	Congo, Dem. Rep.	0.438	0.437	0.43	0.437	0.430	0.430	0.437	0.433	0.438
36	Costa Rica	0.855	0.857	0.86	0.860	0.860	0.850	0.853	0.853	0.857
37	Cote of Ivoire	0.433	0.432	0.45	0.447	0.400	0.362	0.365	0.380	0.380
38	Cuba	0.838	0.840	0.84	0.845	0.85	0.845	0.847	0.848	0.850
39	Cyprus	0.867	0.868	0.86	0.870	0.880	0.880	0.882	0.882	0.883
40	Czech Republic	0.772	0.772	0.78	0.790	0.800	0.815	0.818	0.828	0.832

INDICATOR TABLE 1: INDEX OF LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
41	Denmark	0.838	0.838	0.837	0.838	0.840	0.845	0.845	0.852	0.853
42	Djibouti	0.388	0.39	0.397	0.403	0.410	0.423	0.430	0.317	0.302
43	Dominica	0.783	0.745	0.783	0.800	0.810	0.817	0.850	0.824	0.798
44	Dominican Republic	0.743	0.745	0.750	0.755	0.760	0.760	0.765	0.703	0.702
45	Ecuador	0.730	0.733	0.738	0.742	0.740	0.742	0.745	0.747	0.702
46	Egypt	0.643	0.648	0.655	0.663	0.680	0.688	0.695	0.698	0.705
47	El Salvador	0.690	0.697	0.738	0.740	0.740	0.735	0.740	0.482	0.745
48	Equatorial Guinea	0.383	0.387	0.393	0.400	0.410	0.417	0.423	0.427	0.433
49	Estonia	0.738	0.737	0.737	0.737	0.730	0.728	0.733	0.755	0.760
50	Ethiopia	0.375	0.380	0.387	0.395	0.350	0.305	0.307	0.318	0.315
51	Fiji	0.775	0.777	0.780	0.785	0.790	0.795	0.798	0.730	0.735
52	Finland	0.845	0.847	0.855	0.857	0.860	0.863	0.867	0.873	0.877
53	France	0.865	0.867	0.895	0.895	0.890	0.885	0.887	0.890	0.893
54	Gabon	0.475	0.478	0.485	0.492	0.470	0.457	0.457	0.460	0.462
55	Gambia	0.333	0.337	0.343	0.350	0.360	0.367	0.373	0.348	0.353
56	Georgia	0.797	0.798	0.802	0.803	0.800	0.795	0.798	0.800	0.803
57	Germany	0.850	0.852	0.855	0.857	0.860	0.870	0.872	0.877	0.878
58	Ghana	0.517	0.520	0.527	0.533	0.560	0.583	0.590	0.527	0.530
59	Greece	0.877	0.878	0.880	0.882	0.880	0.885	0.887	0.885	0.887
60	Grenada	0.750	0.767	0.783	0.783	0.780	0.783	0.783	0.660	0.672
61	Guatemala	0.663	0.668	0.677	0.685	0.670	0.650	0.657	0.658	0.663
62	Guinea	0.325	0.328	0.335	0.342	0.350	0.358	0.365	0.325	0.375
63	Guinea Bissau	0.325	0.312	0.303	0.307	0.320	0.333	0.332	0.325	0.330
64	Guyana	0.670	0.673	0.637	0.642	0.650	0.657	0.663	0.638	0.633
65	Haiti	0.527	0.530	0.490	0.493	0.490	0.478	0.483	0.457	0.460
66	Honduras	0.712	0.715	0.723	0.730	0.740	0.740	0.743	0.678	0.678
67	Hong Kong, China (SAR)	0.893	0.895	0.900	0.900	0.900	0.892	0.893	0.907	0.908
68	Hungary	0.733	0.733	0.730	0.732	0.750	0.765	0.768	0.768	0.772
69	Iceland	0.887	0.887	0.902	0.903	0.900	0.900	0.902	0.902	0.903
70	India	0.590	0.595	0.605	0.610	0.620	0.627	0.632	0.632	0.638
71	Indonesia	0.628	0.633	0.642	0.650	0.660	0.668	0.677	0.680	0.687
72	Iran, Islamic Republic of	0.708	0.712	0.720	0.725	0.730	0.737	0.742	0.725	0.732
73	Ireland	0.838	0.840	0.855	0.857	0.860	0.855	0.860	0.857	0.860
74	Israel	0.858	0.860	0.875	0.875	0.880	0.880	0.882	0.893	0.895
75	Italy	0.875	0.877	0.880	0.883	0.890	0.887	0.888	0.890	0.892
76	Jamaica	0.810	0.812	0.815	0.818	0.820	0.830	0.833	0.835	0.838
77	Japan	0.908	0.910	0.913	0.915	0.920	0.917	0.917	0.930	0.933
78	Jordan	0.715	0.718	0.725	0.732	0.740	0.752	0.757	0.752	0.755
79	Kazakhstan	0.743	0.745	0.708	0.708	0.710	0.710	0.715	0.657	0.660
80	Kenya	0.512	0.508	0.477	0.480	0.470	0.450	0.438	0.438	0.430
81	Korea, Republic Of	0.768	0.772	0.775	0.778	0.780	0.790	0.793	0.828	0.832
82	Kuwait	0.832	0.833	0.837	0.840	0.840	0.848	0.852	0.850	0.853
83	Kyrgyz Stan	0.733	0.737	0.713	0.715	0.710	0.710	0.717	0.707	0.660

INDICATOR TABLE 1: INDEX OF LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998****	1999	2000	2001	2002	
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
84	Lao People's Dem. Rep.	0.433	0.438	0.445	0.453	0.460	0.470	0.478	0.468	0.475
85	Latvia	0.735	0.733	0.715	0.717	0.720	0.723	0.728	0.752	0.475
86	Lebanon	0.725	0.728	0.733	0.738	0.740	0.748	0.752	0.798	0.802
87	Lesotho	0.592	0.597	0.548	0.552	0.530	0.517	0.503	0.382	0.345
88	Libyan Arab Jamahiriya	0.635	0.640	0.647	0.655	0.700	0.750	0.753	0.755	0.758
89	Lithuania	0.757	0.755	0.752	0.753	0.750	0.748	0.753	0.780	0.785
90	Luxembourg	0.845	0.847	0.848	0.852	0.860	0.862	0.863	0.870	0.873
91	Madagascar	0.525	0.530	0.537	0.543	0.540	0.542	0.548	0.453	0.460
92	Malawi	0.343	0.342	0.268	0.267	0.250	0.238	0.242	0.255	0.250
93	Malaysia	0.763	0.765	0.770	0.773	0.780	0.783	0.787	0.787	0.792
94	Maldives	0.618	0.623	0.630	0.638	0.650	0.658	0.667	0.679	0.692
95	Mali	0.350	0.353	0.360	0.367	0.420	0.472	0.478	0.437	0.442
96	Malta	0.852	0.853	0.857	0.858	0.860	0.870	0.872	0.882	0.883
97	Mauritania	0.442	0.445	0.452	0.458	0.470	0.475	0.482	0.435	0.442
98	Mauritius	0.753	0.757	0.762	0.765	0.770	0.773	0.777	0.768	0.772
99	Mexico	0.763	0.767	0.783	0.785	0.790	0.787	0.788	0.79	0.793
100	Moldova, Republic of	0.710	0.710	0.712	0.713	0.710	0.708	0.713	0.693	0.693
101	Mongolia	0.645	0.648	0.657	0.663	0.670	0.680	0.687	0.625	0.632
102	Morocco	0.638	0.643	0.672	0.672	0.680	0.685	0.693	0.700	0.703
103	Mozambique	0.357	0.357	0.350	0.355	0.350	0.337	0.313	0.247	0.238
104	Myanmar	0.543	0.548	0.557	0.565	0.580	0.585	0.593	0.517	0.517
105	Namibia	0.563	0.568	0.515	0.513	0.490	0.457	0.418	0.332	0.328
106	Nepal	0.475	0.480	0.505	0.515	0.530	0.538	0.547	0.552	0.560
107	Netherlands	0.873	0.875	0.872	0.875	0.880	0.882	0.883	0.883	0.885
108	New Zealand	0.842	0.843	0.857	0.860	0.860	0.865	0.868	0.873	0.877
109	Nicaragua	0.695	0.702	0.705	0.708	0.710	0.715	0.718	0.718	0.723
110	Niger	0.358	0.362	0.368	0.375	0.380	0.392	0.398	0.330	0.337
111	Nigeria	0.423	0.427	0.433	0.490	0.450	0.418	0.418	0.442	0.445
112	Norway	0.865	0.867	0.875	0.877	0.880	0.885	0.888	0.890	0.892
113	Oman	0.743	0.747	0.750	0.755	0.760	0.765	0.768	0.763	0.767
114	Pakistan	0.608	0.613	0.622	0.630	0.640	0.650	0.657	0.577	0.583
115	Panama	0.797	0.798	0.803	0.807	0.810	0.810	0.813	0.815	0.817
116	Papua New Guinea	0.513	0.517	0.523	0.530	0.540	0.548	0.555	0.520	0.528
117	Paraguay	0.750	0.752	0.730	0.735	0.740	0.743	0.747	0.748	0.752
118	Peru	0.683	0.688	0.707	0.712	0.720	0.722	0.727	0.725	0.730
119	Philippines	0.688	0.692	0.700	0.707	0.710	0.722	0.727	0.733	0.738
120	Poland	0.768	0.768	0.770	0.768	0.780	0.792	0.795	0.802	0.805
121	Portugal	0.827	0.828	0.827	0.830	0.830	0.838	0.842	0.842	0.845
122	Qatar	0.758	0.760	0.765	0.768	0.770	0.778	0.782	0.738	0.743
123	Russian Federation	0.710	0.707	0.678	0.675	0.680	0.693	0.695	0.685	0.685
124	Rwanda	0.372	0.370	0.000	0.307	0.280	0.258	0.260	0.248	0.253

INDICATOR TABLE 1: INDEX OF LIFE EXPECTANCY AT BIRTH IN YEARS

	Report Year	1995	1996	1997	1998	*****	1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
125	Saint Kitts and Nevis	0.750	0.750	0.733	0.733	0.740	0.750	0.750	0.750	0.750
126	Saint Vincent and the Grenadines	0.767	0.767	0.783	0.783	0.790	0.800	0.800	0.772	0.743
127	Samoa (Western)	0.710	0.713	0.718	0.723	0.750	0.772	0.778	0.732	0.737
128	Sao Tome and Principe	0.700	0.700	0.700	0.733	0.690	0.650	0.650	0.668	0.668
129	Saudi Arabia	0.745	0.748	0.755	0.762	0.770	0.773	0.778	0.772	0.777
130	Senegal	0.405	0.408	0.415	0.422	0.440	0.455	0.462	0.465	0.472
131	Seychelles	0.767	0.767	0.783	0.783	0.780	0.767	0.767	0.781	0.795
132	Sierra Leone	0.233	0.237	0.143	0.162	0.180	0.203	0.215	0.222	0.232
133	Singapore	0.830	0.832	0.868	0.868	0.870	0.868	0.872	0.873	0.877
134	Slovakia	0.765	0.765	0.763	0.765	0.780	0.800	0.802	0.802	0.805
135	Solomon Islands	0.757	0.758	0.763	0.768	0.770	0.778	0.782	0.752	0.722
136	South Africa	0.632	0.637	0.645	0.652	0.570	0.495	0.470	0.482	0.452
137	Spain	0.877	0.878	0.877	0.878	0.880	0.883	0.885	0.888	0.892
138	Sri Lanka	0.782	0.783	0.787	0.792	0.800	0.802	0.805	0.782	0.785
139	Sudan	0.467	0.470	0.433	0.453	0.480	0.500	0.507	0.510	0.517
140	Surinam	0.755	0.758	0.762	0.765	0.760	0.752	0.755	0.757	0.760
141	Swaziland	0.542	0.547	0.555	0.563	0.580	0.587	0.595	0.367	0.323
142	Sweden	0.887	0.888	0.888	0.890	0.890	0.892	0.895	0.910	0.912
143	Switzerland	0.883	0.885	0.885	0.887	0.890	0.893	0.895	0.897	0.898
144	Syrian Arab Republic	0.702	0.705	0.713	0.718	0.730	0.732	0.737	0.765	0.770
145	Tajikistan	0.753	0.757	0.697	0.698	0.700	0.703	0.708	0.707	0.710
146	Tanzania, U. Rep	0.452	0.452	0.422	0.427	0.400	0.382	0.382	0.435	0.435
147	Thailand	0.733	0.737	0.742	0.742	0.740	0.730	0.732	0.748	0.753
148	Togo	0.500	0.503	0.427	0.592	0.490	0.397	0.400	0.443	0.447
149	Trinidad and Tobago	0.777	0.778	0.798	0.802	0.810	0.813	0.817	0.818	0.822
150	Turkmenistan	0.667	0.668	0.662	0.665	0.670	0.673	0.678	0.682	0.687
151	Turkey	0.692	0.695	0.720	0.725	0.730	0.733	0.738	0.742	0.687
152	Uganda	0.332	0.328	0.253	0.258	0.250	0.243	0.262	0.303	0.317
153	Ukraine	0.740	0.738	0.723	0.725	0.730	0.730	0.735	0.718	0.718
154	United Arab Emirates	0.813	0.815	0.820	0.823	0.830	0.830	0.833	0.830	0.833
155	United Kingdom	0.853	0.855	0.862	0.863	0.870	0.870	0.872	0.875	0.878
156	United States	0.850	0.852	0.853	0.857	0.860	0.862	0.863	0.863	0.867
157	Uruguay	0.792	0.793	0.793	0.795	0.810	0.815	0.818	0.820	0.823
158	Uzbekistan	0.737	0.740	0.708	0.725	0.720	0.708	0.713	0.728	0.733
159	Vanuatu	0.670	0.673	0.682	0.688	0.700	0.707	0.712	0.717	0.717
160	Venezuela	0.778	0.780	0.785	0.788	0.790	0.790	0.793	0.795	0.798
161	Viet Nam	0.670	0.675	0.683	0.690	0.700	0.707	0.713	0.713	0.720
162	Yemen	0.420	0.423	0.520	0.528	0.540	0.550	0.558	0.585	0.593
163	Zambia	0.398	0.393	0.293	0.295	0.270	0.252	0.258	0.267	0.273
164	Zimbabwe	0.478	0.473	0.400	0.398	0.360	0.318	0.308	0.298	0.298

INDICATOR TABLE 2: INDEX OF EDUCATIONAL ACHIEVEMENT

	Report year	1995	1996	1997	1998		199	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	199	1998	1999	2000
1	Albania	0.770	0.713	0.720	0.720	0.743	0.76	0.763	0.775	0.779
2	Algeria	0.617	0.658	0.627	0.738	0.690	0.64	0.673	0.693	0.694
3	Armenia	0.884	0.881	0.884	0.884	0.869	0.85	0.851	0.892	0.892
4	Angola	0.378	0.370	0.368	0.360	0.360	0.36	0.335	0.325	0.325
5	Antigua and Barbuda	0.860	0.855	0.860	0.855	0.855	0.85	0.865	0.799	0.778
6	Argentina	0.875	0.884	0.865	0.876	0.877	0.87	0.884	0.899	0.899
7	Australia	0.890	0.890	0.890	0.890	0.943	0.99	0.995	0.995	0.995
8	Austria	0.915	0.920	0.930	0.930	0.928	0.92	0.925	0.945	0.945
9	Azerbaijan	0.822	0.855	0.842	0.842	0.839	0.83	0.855	0.787	0.84
10	Bahamas	0.860	0.853	0.866	0.851	0.850	0.84	0.848	0.849	0.847
11	Bahrain	0.838	0.853	0.847	0.846	0.841	0.83	0.838	0.836	0.838
12	Bangladesh	0.372	0.401	0.382	0.376	0.373	0.37	0.381	0.389	0.392
13	Barbados	0.855	0.875	0.867	0.872	0.880	0.88	0.885	0.870	0.875
14	Belgium	0.915	0.920	0.925	0.925	0.960	0.99	0.995	0.995	0.995
15	Benin	0.335	0.359	0.353	0.375	0.377	0.38	0.404	0.420	0.412
16	Bhutan	0.351	0.365	0.361	0.366	0.371	0.37	0.375	0.375	0.400
17	Bolivia	0.734	0.762	0.743	0.761	0.764	0.76	0.772	0.775	0.778
18	Botswana	0.691	0.733	0.699	0.704	0.721	0.73	0.733	0.732	0.736
19	Brazil	0.760	0.783	0.774	0.777	0.798	0.82	0.843	0.825	0.826
20	Brunei Darussalam	0.772	0.804	0.790	0.811	0.811	0.81	0.814	0.910	0.913
21	Bulgaria	0.800	0.816	0.795	0.820	0.831	0.84	0.856	0.852	0.852
22	Burkina Faso	0.182	0.206	0.194	0.191	0.197	0.20	0.221	0.230	0.235
23	Burundi	0.320	0.384	0.328	0.292	0.315	0.33	0.339	0.330	0.335
24	Cambodia	0.339	0.475	0.465	0.635	0.635	0.63	0.630	0.651	0.649
25	Cameroon	0.548	0.608	0.541	0.542	0.558	0.57	0.598	0.589	0.594
26	Canada	0.995	0.995	0.995	0.995	0.993	0.99	0.995	0.980	0.980
27	Cape Verde	0.627	0.675	0.670	0.678	0.709	0.74	0.755	0.753	0.754
28	Central African Republic	0.455	0.405	0.471	0.435	0.389	0.34	0.350	0.347	0.354
29	Chad	0.365	0.332	0.360	0.376	0.386	0.39	0.357	0.360	0.368
30	Chile	0.828	0.832	0.835	0.841	0.851	0.86	0.867	0.868	0.869
31	China	0.672	0.699	0.695	0.728	0.744	0.76	0.774	0.783	0.786
32	Colombia	0.787	0.796	0.806	0.802	0.806	0.81	0.811	0.823	0.824
33	Comoros	0.463	0.483	0.479	0.482	0.477	0.47	0.488	0.476	0.460
34	Congo	0.634	0.672	0.650	0.715	0.720	0.72	0.717	0.713	0.719
35	Congo, Dem. Rep. Of	0.634	0.575	0.650	0.715	0.647	0.58	0.460	0.462	0.467
36	Costa Rica	0.802	0.817	0.814	0.819	0.812	0.80	0.807	0.813	0.813
37	Cote of Ivoire	0.378	0.418	0.392	0.391	0.402	0.41	0.428	0.419	0.424
38	Cuba	0.800	0.807	0.792	0.809	0.824	0.8	0.847	0.863	0.864
39	Cyprus	0.845	0.863	0.845	0.865	0.870	0.87	0.888	0.830	0.831
40	Czech Republic	0.835	0.830	0.845	0.845	0.855	0.86	0.865	0.845	0.845

INDICATOR TABLE 2: INDEX OF EDUCATIONAL ACHIEVEMENT

	Report year	1995	1996	1997	1998		1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
4	Denmark	0.915	0.930	0.940	0.940	0.940	0.940	0.960	0.980	0.980
4	Djibouti	0.306	0.316	0.325	0.331	0.339	0.347	0.417	0.427	0.433
4	Dominica	0.870	0.790	0.855	0.855	0.855	0.855	0.840	0.801	0.807
4	Dominican Republic	0.764	0.734	0.748	0.776	0.759	0.743	0.764	0.776	0.778
4	Ecuador	0.797	0.813	0.808	0.806	0.812	0.819	0.828	0.84	0.843
4	Egypt	0.581	0.614	0.598	0.602	0.613	0.624	0.639	0.653	0.657
4	El Salvador	0.619	0.659	0.630	0.648	0.676	0.705	0.709	0.707	0.709
4	Equatorial Guinea	0.677	0.706	0.709	0.713	0.716	0.720	0.731	0.731	0.736
4	Estonia	0.845	0.885	0.855	0.855	0.878	0.900	0.925	0.807	0.929
5	Ethiopia	0.234	0.262	0.263	0.278	0.287	0.297	0.312	0.322	0.331
5	Fiji	0.841	0.856	0.852	0.848	0.854	0.859	0.866	0.883	0.885
5	Finland	0.975	0.975	0.980	0.980	0.985	0.990	1.000	0.995	0.995
5	France	0.925	0.935	0.940	0.940	0.948	0.955	0.960	0.965	0.965
5	Gabon	0.530	0.550	0.613	0.616	0.624	0.631	0.630	0.745	0.785
5	Gambia	0.343	0.343	0.356	0.388	0.379	0.371	0.378	0.404	0.408
5	Georgia	0.885	0.835	0.820	0.840	0.845	0.850	0.855	0.845	0.845
5	Germany	0.900	0.890	0.900	0.900	0.918	0.935	0.945	0.965	0.965
5	Ghana	0.529	0.571	0.537	0.543	0.542	0.542	0.561	0.562	0.568
5	Greece	0.859	0.875	0.894	0.894	0.886	0.878	0.890	0.891	0.891
6	Grenada	0.880	0.870	0.880	0.880	0.875	0.870	0.860	0.801	0.797
6	Guatemala	0.486	0.562	0.509	0.555	0.562	0.568	0.572	0.586	0.588
6	Guinea	0.275	0.300	0.294	0.305	0.317	0.330	0.325	0.315	0.345
6	Guinea Bissau	0.275	0.334	0.415	0.420	0.379	0.338	0.354	0.374	0.378
6	Guyana	0.828	0.842	0.825	0.811	0.811	0.811	0.822	0.647	0.823
6	Haiti	0.363	0.389	0.366	0.370	0.360	0.349	0.359	0.522	0.509
6	Honduras	0.649	0.672	0.66	0.664	0.654	0.644	0.657	0.675	0.678
6	Hong Kong, China (SAR)	0.806	0.820	0.822	0.796	0.792	0.787	0.785	0.782	0.783
6	Hungary	0.830	0.832	0.830	0.830	0.848	0.865	0.872	0.900	0.902
6	Iceland	0.900	0.905	0.910	0.910	0.920	0.930	0.940	0.940	0.940
7	India	0.525	0.554	0.536	0.535	0.539	0.543	0.549	0.563	0.566
7	Indonesia	0.713	0.734	0.726	0.729	0.737	0.745	0.754	0.757	0.760
7	Iran, Islamic Republic of	0.665	0.708	0.683	0.68	0.703	0.727	0.718	0.744	0.747
7	Ireland	0.910	0.915	0.935	0.935	0.935	0.935	0.950	0.950	0.950
7	Israel	0.860	0.859	0.850	0.850	0.864	0.877	0.884	0.894	0.888
7	Italy	0.837	0.842	0.856	0.856	0.879	0.902	0.907	0.912	0.912
7	Jamaica	0.744	0.750	0.747	0.760	0.751	0.743	0.745	0.742	0.745
7	Japan	0.880	0.885	0.885	0.885	0.903	0.920	0.920	0.905	0.905
7	Jordan	0.750	0.773	0.758	0.763	0.765	0.766	0.788	0.721	0.724
7	Kazakhstan	0.823	0.820	0.853	0.860	0.868	0.875	0.880	0.880	0.875
8	Kenya	0.658	0.683	0.660	0.651	0.649	0.647	0.653	0.663	0.667
8	Korea, Republic Of	0.882	0.893	0.900	0.905	0.921	0.936	0.938	0.938	0.939
8	Kuwait	0.620	0.670	0.674	0.683	0.685	0.687	0.695	0.705	0.705
8	Kyrgyz Stan	0.870	0.835	0.850	0.850	0.840	0.830	0.835	0.825	0.825

INDICATOR TABLE 2: INDEX OF EDUCATIONAL ACHIEVEMENT

	Report year	1995	199	1997	1998		1999	2000	2001	2002
	Data Year	1992	199	1994	1995	1996	1997	1998	1999	2000
84	Lao People's Dem. Rep.	0.508	0.48	0.529	0.533	0.551	0.568	0.516	0.527	0.534
85	Latvia	0.835	0.85	0.830	0.830	0.840	0.850	0.874	0.905	0.909
86	Lebanon	0.822	0.79	0.835	0.837	0.820	0.802	0.811	0.818	0.820
87	Lesotho	0.628	0.68	0.633	0.637	0.669	0.702	0.697	0.720	0.722
88	Libyan Arab Jamahiriya	0.692	0.83	0.830	0.831	0.837	0.843	0.851	0.856	0.860
89	Lithuania	0.827	0.85	0.842	0.845	0.858	0.870	0.883	0.895	0.898
90	Luxembourg	0.775	0.78	0.785	0.785	0.813	0.840	0.840	0.860	0.860
91	Madagascar	0.582	0.49	0.394	0.384	0.407	0.430	0.525	0.549	0.553
92	Malawi	0.500	0.52	0.614	0.662	0.663	0.664	0.666	0.661	0.666
93	Malaysia	0.708	0.73	0.725	0.723	0.738	0.754	0.757	0.870	0.873
94	Maldives	0.793	0.83	0.820	0.821	0.835	0.849	0.855	0.883	0.869
95	Mali	0.211	0.27	0.232	0.245	0.274	0.303	0.321	0.339	0.348
96	Malta	0.81	0.83	0.810	0.835	0.840	0.846	0.853	0.859	0.79
97	Mauritania	0.341	0.38	0.365	0.379	0.388	0.397	0.416	0.413	0.406
98	Mauritius	0.701	0.71	0.717	0.720	0.725	0.730	0.734	0.736	0.738
99	Mexico	0.768	0.77	0.776	0.783	0.792	0.801	0.804	0.811	0.812
100	Moldova, Republic of	0.860	0.87	0.830	0.830	0.836	0.842	0.843	0.854	0.855
101	Mongolia	0.706	0.72	0.671	0.680	0.687	0.695	0.700	0.602	0.785
102	Morocco	0.418	0.45	0.436	0.459	0.467	0.475	0.486	0.500	0.505
103	Mozambique	0.310	0.33	0.323	0.326	0.327	0.328	0.337	0.331	0.312
104	Myanmar	0.645	0.66	0.654	0.656	0.674	0.693	0.701	0.697	0.699
105	Namibia	0.605	0.61	0.620	0.795	0.802	0.809	0.824	0.797	0.800
106	Nepal	0.403	0.48	0.410	0.428	0.457	0.486	0.501	0.502	0.509
107	Netherlands	0.935	0.94	0.950	0.950	0.968	0.985	0.990	0.995	0.995
108	New Zealand	0.920	0.94	0.965	0.965	0.968	0.970	0.975	0.990	0.990
109	Nicaragua	0.629	0.64	0.637	0.649	0.640	0.632	0.655	0.656	0.648
110	Niger	0.132	0.14	0.141	0.143	0.145	0.147	0.149	0.157	0.160
111	Nigeria	0.518	0.56	0.528	0.531	0.549	0.568	0.521	0.538	0.545
112	Norway	0.935	0.94	0.955	0.955	0.963	0.970	0.980	0.980	0.980
113	Oman	0.470	0.47	0.475	0.595	0.610	0.626	0.634	0.642	0.649
114	Pakistan	0.304	0.36	0.376	0.394	0.407	0.420	0.435	0.425	0.416
115	Panama	0.788	0.80	0.803	0.814	0.817	0.821	0.822	0.829	0.830
116	Papua New Guinea	0.519	0.49	0.546	0.546	0.550	0.554	0.501	0.515	0.515
117	Paraguay	0.751	0.77	0.770	0.776	0.779	0.782	0.789	0.785	0.787
118	Peru	0.832	0.84	0.847	0.839	0.836	0.834	0.841	0.848	0.850
119	Philippines	0.855	0.85	0.862	0.873	0.878	0.883	0.889	0.886	0.887
120	Poland	0.870	0.87	0.890	0.890	0.885	0.880	0.894	0.915	0.919
121	Portugal	0.816	0.85	0.853	0.853	0.881	0.909	0.922	0.94	0.941
122	Qatar	0.766	0.77	0.760	0.752	0.754	0.755	0.772	0.779	0.781
123	Russian Federation	0.839	0.89	0.884	0.885	0.883	0.880	0.893	0.885	0.888
124	Rwanda	0.479	0.51	0.481	0.420	0.475	0.530	0.535	0.529	0.534

INDICATOR TABLE 2: INDEX OF EDUCATIONAL ACHIEVEMENT

	Report year	1995	1996	1997	1998	1999	2000	2001	2002	
	Data Year	1992	1993	1994	1995	1996	199	1998	1999	2000
125	Saint Kitts and Nevis	0.885	0.840	0.840	0.840	0.840	0.84	0.845	0.82	0.839
126	Saint Vincent & the Grenadines	0.880	0.800	0.800	0.800	0.800	0.80	0.750	0.717	0.735
127	Samoa (Western)	0.880	0.860	0.860	0.860	0.840	0.82	0.724	0.693	0.726
128	Sao Tome and Principe	0.540	0.585	0.620	0.660	0.660	0.66	0.570	0.640	0.706
129	Saudi Arabia	0.563	0.582	0.589	0.600	0.624	0.64	0.661	0.686	0.687
130	Senegal	0.308	0.333	0.316	0.331	0.339	0.34	0.358	0.362	0.367
131	Seychelles	0.690	0.725	0.745	0.745	0.735	0.72	0.800	0.870	0.880
132	Sierra Leone	0.284	0.295	0.292	0.307	0.312	0.31	0.275	0.295	0.315
133	Singapore	0.790	0.799	0.815	0.796	0.809	0.82	0.824	0.836	0.837
134	Slovakia	0.850	0.850	0.855	0.855	0.863	0.87	0.870	0.875	0.875
135	Solomon Islands	0.340	0.540	0.545	0.545	0.543	0.54	0.540	0.597	0.633
136	South Africa	0.783	0.813	0.812	0.814	0.850	0.88	0.898	0.89	0.892
137	Spain	0.920	0.922	0.936	0.936	0.941	0.94	0.957	0.963	0.963
138	Sri Lanka	0.777	0.786	0.781	0.786	0.785	0.78	0.786	0.807	0.808
139	Sudan	0.369	0.434	0.379	0.391	0.414	0.43	0.449	0.455	0.459
140	Suriname	0.816	0.820	0.819	0.820	0.821	0.82	0.865	0.88	0.885
141	Swaziland	0.720	0.742	0.736	0.769	0.761	0.75	0.752	0.805	0.808
142	Sweden	0.885	0.895	0.905	0.905	0.950	0.99	0.995	0.995	0.995
143	Switzerland	0.865	0.870	0.875	0.875	0.883	0.89	0.895	0.855	0.855
144	Syrian Arab Republic	0.674	0.689	0.669	0.664	0.661	0.65	0.659	0.683	0.687
145	Tajikistan	0.819	0.840	0.829	0.840	0.840	0.84	0.840	0.830	0.831
146	Tanzania, U. Rep. Of	0.492	0.538	0.504	0.504	0.514	0.52	0.533	0.534	0.536
147	Thailand	0.733	0.745	0.733	0.744	0.756	0.76	0.780	0.777	0.778
148	Togo	0.540	0.531	0.502	0.559	0.565	0.57	0.586	0.592	0.596
149	Trinidad and Tobago	0.827	0.802	0.825	0.815	0.817	0.81	0.797	0.696	0.794
150	Turkmenistan	0.874	0.875	0.939	0.940	0.940	0.94	0.850	0.895	0.895
151	Turkey	0.708	0.730	0.723	0.712	0.716	0.72	0.725	0.733	0.736
152	Uganda	0.478	0.500	0.476	0.499	0.510	0.52	0.530	0.556	0.561
153	Ukraine	0.825	0.875	0.874	0.870	0.875	0.88	0.885	0.880	0.880
154	United Arab Emirates	0.789	0.778	0.803	0.741	0.730	0.71	0.723	0.716	0.722
155	United Kingdom	0.880	0.910	0.925	0.925	0.960	0.99	0.995	0.995	0.995
156	United States	0.970	0.975	0.975	0.975	0.970	0.96	0.965	0.970	0.970
157	Uruguay	0.870	0.868	0.861	0.867	0.870	0.87	0.878	0.884	0.884
158	Uzbekistan	0.871	0.805	0.851	0.870	0.873	0.87	0.825	0.823	0.876
159	Vanuatu	0.585	0.580	0.580	0.580	0.568	0.55	0.555	0.550	0.550
160	Venezuela	0.807	0.805	0.795	0.791	0.793	0.79	0.795	0.787	0.788
161	Viet Nam	0.705	0.720	0.740	0.744	0.757	0.77	0.780	0.801	0.802
162	Yemen	0.426	0.446	0.466	0.435	0.446	0.45	0.466	0.481	0.487
163	Zambia	0.621	0.627	0.623	0.651	0.636	0.62	0.627	0.631	0.655
164	Zimbabwe	0.767	0.786	0.764	0.771	0.783	0.79	0.776	0.765	0.769

INDICATOR TABLE 3: INDEX OF WELFARE THROUGH INCOME

	Report Year	1995	1996	1997	1998		1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
1	Albania	0.361	0.223	0.285	0.292	0.253	0.215	0.287	0.328	0.362
2	Algeria	0.507	0.545	0.540	0.547	0.522	0.463	0.498	0.523	0.534
3	Armenia	0.246	0.206	0.174	0.224	0.232	0.240	0.209	0.225	0.261
4	Angola	0.069	0.061	0.159	0.185	0.163	0.141	0.183	0.327	0.222
5	Antigua and Barbuda	0.461	0.537	0.655	0.659	0.666	0.673	0.663	0.678	0.692
6	Argentina	0.652	0.639	0.654	0.643	0.666	0.687	0.723	0.728	0.729
7	Australia	0.819	0.823	0.832	0.836	0.839	0.843	0.867	0.888	0.898
8	Austria	0.825	0.830	0.848	0.855	0.859	0.863	0.874	0.892	0.907
9	Azerbaijan	0.260	0.222	0.167	0.145	0.149	0.154	0.220	0.292	0.301
10	Bahamas	0.807	0.791	0.787	0.785	0.792	0.799	0.768	0.778	0.803
11	Bahrain	0.767	0.781	0.779	0.799	0.798	0.796	0.743	0.753	0.775
12	Bangladesh	0.120	0.126	0.131	0.136	0.119	0.101	0.134	0.147	0.160
13	Barbados	0.672	0.693	0.703	0.709	0.716	0.722	0.722	0.764	0.781
14	Belgium	0.824	0.835	0.851	0.857	0.864	0.870	0.875	0.896	0.911
15	Benin	0.162	0.165	0.170	0.181	0.152	0.124	0.081	0.088	0.095
16	Bhutan	0.069	0.073	0.126	0.136	0.141	0.145	0.153	0.146	0.139
17	Bolivia	0.245	0.256	0.265	0.267	0.281	0.295	0.230	0.239	0.247
18	Botswana	0.526	0.530	0.537	0.547	0.586	0.620	0.566	0.594	0.604
19	Brazil	0.531	0.542	0.537	0.560	0.570	0.580	0.585	0.599	0.618
20	Brunei Darussalam	0.847	0.821	0.937	0.942	0.937	0.932	0.799	0.814	0.800
21	Bulgaria	0.441	0.448	0.471	0.478	0.486	0.415	0.500	0.524	0.551
22	Burkina Faso	0.075	0.072	0.074	0.073	0.085	0.097	0.082	0.092	0.093
23	Burundi	0.066	0.061	0.064	0.057	0.057	0.056	0.050	0.051	0.052
24	Cambodia	0.122	0.122	0.105	0.107	0.117	0.126	0.123	0.134	0.143
25	Cameroon	0.243	0.225	0.215	0.239	0.215	0.19	0.146	0.156	0.17
26	Canada	0.846	0.851	0.856	0.861	0.864	0.867	0.878	0.903	0.916
27	Cape Verde	0.175	0.183	0.187	0.267	0.287	0.307	0.333	0.466	0.506
28	Central African Republic	0.109	0.101	0.109	0.105	0.118	0.131	0.108	0.113	0.114
29	Chad	0.070	0.063	0.064	0.114	0.103	0.092	0.080	0.080	0.082
30	Chile	0.640	0.653	0.659	0.679	0.709	0.736	0.650	0.647	0.666
31	China	0.196	0.237	0.266	0.301	0.311	0.322	0.319	0.374	0.412
32	Colombia	0.542	0.554	0.567	0.575	0.584	0.592	0.563	0.553	0.572
33	Comoros	0.133	0.109	0.134	0.129	0.141	0.152	0.138	0.141	0.158
34	Congo	0.294	0.281	0.245	0.261	0.211	0.161	0.095	0.067	0.077
35	Congo, Dem. Rep.	0.294	0.281	0.245	0.261	0.172	0.083	0.077	0.074	0.077
36	Costa Rica	0.571	0.549	0.559	0.561	0.574	0.586	0.562	0.652	0.647
37	Cote d' Ivoire	0.171	0.161	0.167	0.173	0.179	0.185	0.159	0.165	0.162
38	Cuba	0.352	0.308	0.308	0.319	0.319	0.319	0.411	0.440	0.469
39	Cyprus	0.775	0.759	0.742	0.747	0.754	0.761	0.809	0.828	0.849
40	Czech Republic	0.620	0.641	0.661	0.675	0.684	0.692	0.729	0.741	0.758

INDICATOR TABLE 3: INDEX OF WELFARE THROUGH INCOME

	Report Year	1995	1996	1997	1998		1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
41	Denmark	0.829	0.842	0.855	0.862	0.871	0.879	0.884	0.899	0.915
42	Djibouti	0.154	0.072	0.124	0.127	0.126	0.124	0.124	0.242	0.242
43	Dominica	0.364	0.381	0.567	0.578	0.537	0.448	0.525	0.542	0.558
44	Dominican Republic	0.338	0.381	0.407	0.406	0.454	0.501	0.478	0.543	0.564
45	Ecuador	0.451	0.457	0.481	0.478	0.496	0.514	0.308	0.307	0.330
46	Egypt	0.365	0.393	0.398	0.396	0.355	0.313	0.312	0.353	0.375
47	El Salvador	0.228	0.240	0.246	0.267	0.281	0.295	0.418	0.451	0.467
48	Equatorial Guinea	0.064	0.181	0.167	0.171	0.177	0.182	0.182	0.486	0.775
49	Estonia	0.588	0.373	0.445	0.421	0.483	0.531	0.619	0.639	0.682
50	Ethiopia	0.024	0.034	0.035	0.038	0.041	0.044	0.050	0.056	0.060
51	Fiji	0.539	0.544	0.553	0.569	0.524	0.413	0.439	0.499	0.485
52	Finland	0.793	0.793	0.808	0.823	0.833	0.842	0.850	0.873	0.892
53	France	0.834	0.830	0.846	0.853	0.858	0.862	0.853	0.871	0.884
54	Gabon	0.405	0.399	0.376	0.389	0.549	0.615	0.576	0.563	0.571
55	Gambia	0.123	0.116	0.089	0.090	0.118	0.146	0.144	0.157	0.165
56	Georgia	0.234	0.175	0.158	0.138	0.168	0.198	0.345	0.248	0.272
57	Germany	0.853	0.826	0.836	0.844	0.849	0.854	0.864	0.88	0.893
58	Ghana	0.213	0.202	0.198	0.205	0.184	0.164	0.174	0.189	0.198
59	Greece	0.638	0.655	0.708	0.715	0.726	0.737	0.757	0.78	0.796
60	Grenada	0.395	0.321	0.527	0.539	0.527	0.506	0.556	0.748	0.616
61	Guatemala	0.343	0.350	0.330	0.380	0.403	0.425	0.362	0.380	0.395
62	Guinea	0.052	0.181	0.107	0.110	0.150	0.189	0.179	0.195	0.095
63	Guinea Bissau	0.052	0.081	0.074	0.076	0.078	0.081	0.055	0.061	0.070
64	Guyana	0.181	0.217	0.279	0.330	0.330	0.330	0.351	0.376	0.410
65	Haiti	0.100	0.101	0.085	0.087	0.106	0.124	0.136	0.145	0.145
66	Honduras	0.202	0.212	0.207	0.199	0.212	0.225	0.248	0.238	0.25
67	Hong Kong, China (SAR)	0.844	0.857	0.865	0.872	0.879	0.886	0.849	0.863	0.893
68	Hungary	0.688	0.565	0.579	0.591	0.598	0.605	0.686	0.711	0.730
69	Iceland	0.811	0.824	0.847	0.852	0.86	0.867	0.893	0.916	0.930
70	India	0.120	0.121	0.133	0.140	0.154	0.167	0.210	0.228	0.240
71	Indonesia	0.303	0.337	0.387	0.411	0.386	0.360	0.271	0.293	0.313
72	Iran, Islamic Republic of	0.539	0.537	0.553	0.542	0.549	0.555	0.526	0.544	0.558
73	Ireland	0.738	0.776	0.79	0.811	0.83	0.848	0.857	0.900	0.933
74	Israel	0.769	0.776	0.789	0.799	0.808	0.818	0.807	0.821	0.842
75	Italy	0.817	0.818	0.833	0.842	0.843	0.843	0.847	0.864	0.879
76	Jamaica	0.329	0.327	0.395	0.393	0.374	0.355	0.349	0.368	0.376
77	Japan	0.846	0.848	0.858	0.861	0.872	0.883	0.875	0.891	0.907
78	Jordan	0.443	0.455	0.434	0.434	0.395	0.356	0.345	0.409	0.411
79	Kazakhstan	0.443	0.383	0.338	0.312	0.34	0.367	0.454	0.263	0.557
80	Kenya	0.138	0.138	0.138	0.142	0.129	0.116	0.093	0.098	0.098
81	Korea, Republic Of	0.662	0.673	0.695	0.714	0.733	0.751	0.749	0.784	0.808
82	Kuwait	0.638	0.858	0.861	0.881	0.888	0.894	0.894	0.807	0.786
83	Kyrgyz Stan	0.292	0.236	0.194	0.194	0.211	0.228	0.235	0.515	0.277

INDICATOR TABLE 3: INDEX OF WELFARE THROUGH INCOME

	Report Year	1995	1996	1997	1998		1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
84	Lao People's Dem. Rep.	0.176	0.144	0.253	0.262	0.195	0.127	0.174	0.146	0.157
85	Latvia	0.565	0.521	0.343	0.337	0.372	0.408	0.552	0.572	0.599
86	Lebanon	0.255	0.255	0.506	0.518	0.569	0.56	0.449	0.489	0.447
87	Lesotho	0.102	0.093	0.107	0.126	0.157	0.187	0.162	0.186	0.205
88	Libyan Arab Jamahiriya	0.675	0.567	0.567	0.574	0.581	0.588	0.588	0.616	0.616
89	Lithuania	0.382	0.320	0.415	0.398	0.418	0.438	0.579	0.586	0.601
90	Luxembourg	0.857	0.895	0.964	0.963	0.952	0.94	0.959	1.000	1.000
91	Madagascar	0.065	0.064	0.063	0.061	0.075	0.088	0.070	0.074	0.079
92	Malawi	0.076	0.065	0.063	0.071	0.068	0.065	0.045	0.052	0.055
93	Malaysia	0.623	0.639	0.652	0.670	0.652	0.633	0.633	0.635	0.658
94	Maldives	0.117	0.223	0.223	0.365	0.373	0.381	0.423	0.459	0.466
95	Mali	0.048	0.046	0.047	0.049	0.059	0.068	0.062	0.069	0.074
96	Malta	0.637	0.714	0.741	0.746	0.745	0.744	0.795	0.777	0.806
97	Mauritania	0.165	0.160	0.159	0.162	0.167	0.173	0.155	0.160	0.167
98	Mauritius	0.716	0.732	0.744	0.746	0.709	0.664	0.638	0.659	0.681
99	Mexico	0.608	0.598	0.610	0.590	0.616	0.639	0.620	0.637	0.657
100	Moldova, Republic of	0.379	0.241	0.157	0.154	0.151	0.149	0.196	0.206	0.213
101	Mongolia	0.243	0.211	0.389	0.405	0.267	0.129	0.153	0.171	0.179
102	Morocco	0.347	0.337	0.380	0.359	0.350	0.341	0.340	0.353	0.366
103	Mozambique	0.030	0.057	0.094	0.091	0.080	0.068	0.072	0.081	0.080
104	Myanmar	0.069	0.058	0.101	0.109	0.113	0.117	0.117	0.098	0.098
105	Namibia	0.416	0.383	0.417	0.420	0.471	0.521	0.528	0.541	0.578
106	Nepal	0.114	0.096	0.110	0.111	0.108	0.105	0.112	0.121	0.130
107	Netherlands	0.813	0.807	0.831	0.839	0.846	0.853	0.864	0.884	0.898
108	New Zealand	0.774	0.799	0.801	0.806	0.807	0.808	0.807	0.830	0.841
109	Nicaragua	0.286	0.232	0.157	0.184	0.193	0.201	0.217	0.231	0.241
110	Niger	0.076	0.073	0.073	0.071	0.075	0.08	0.068	0.069	0.069
111	Nigeria	0.155	0.153	0.133	0.124	0.106	0.087	0.074	0.080	0.085
112	Norway	0.823	0.844	0.855	0.867	0.877	0.886	0.904	0.921	0.933
113	Oman	0.717	0.690	0.682	0.666	0.673	0.679	0.679	0.747	0.747
114	Pakistan	0.243	0.219	0.218	0.224	0.190	0.155	0.172	0.184	0.194
115	Panama	0.547	0.558	0.566	0.572	0.588	0.603	0.532	0.558	0.562
116	Papua New Guinea	0.245	0.258	0.289	0.255	0.263	0.271	0.240	0.241	0.232
117	Paraguay	0.349	0.344	0.364	0.370	0.391	0.412	0.445	0.455	0.459
118	Peru	0.340	0.342	0.377	0.408	0.447	0.486	0.444	0.480	0.272
119	Philippines	0.260	0.264	0.274	0.283	0.323	0.363	0.367	0.394	0.411
120	Poland	0.502	0.489	0.521	0.540	0.562	0.582	0.618	0.641	0.657
121	Portugal	0.677	0.696	0.729	0.735	0.749	0.762	0.769	0.790	0.807
122	Qatar	0.866	0.871	0.821	0.837	0.844	0.851	0.851	0.826	0.826
123	Russian Federation	0.568	0.495	0.502	0.471	0.462	0.454	0.580	0.613	0.639
124	Rwanda	0.065	0.068	0.027	0.076	0.068	0.059	0.059	0.083	0.090

INDICATOR TABLE 3: INDEX OF WELFARE THROUGH INCOME

	Report Year	1995	1996	1997	1998		1999	2000	2001	2002
	Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
125	Saint Kitts and Nevis	0.620	0.665	0.667	0.684	0.658	0.629	0.695	0.714	0.732
126	Saint Vincent & the Grenadines	0.342	0.367	0.549	0.561	0.525	0.441	0.488	0.526	0.545
127	Samoa (Western)	0.188	0.308	0.279	0.302	0.334	0.366	0.396	0.419	0.522
128	Sao Tome and Principe	0.053	0.053	0.170	0.175	0.180	0.186	0.145	0.336	0.180
129	Saudi Arabia	0.677	0.734	0.664	0.643	0.664	0.683	0.684	0.698	0.710
130	Senegal	0.175	0.171	0.159	0.182	0.178	0.173	0.128	0.140	0.150
131	Seychelles	0.547	0.516	0.626	0.620	0.627	0.634	0.694	0.873	0.732
132	Sierra Leone	0.083	0.081	0.058	0.056	0.044	0.033	0.038	0.037	0.041
133	Singapore	0.820	0.833	0.851	0.868	0.896	0.921	0.884	0.849	0.876
134	Slovakia	0.588	0.547	0.577	0.608	0.617	0.626	0.673	0.694	0.707
135	Solomon Islands	0.267	0.230	0.214	0.226	0.230	0.235	0.195	0.180	0.164
136	South Africa	0.393	0.321	0.445	0.450	0.557	0.610	0.642	0.654	0.666
137	Spain	0.748	0.752	0.763	0.771	0.779	0.788	0.792	0.817	0.834
138	Sri Lanka	0.292	0.311	0.337	0.351	0.303	0.254	0.306	0.338	0.364
139	Sudan	0.161	0.133	0.105	0.107	0.131	0.155	0.137	0.060	0.180
140	Suriname	0.386	0.379	0.490	0.506	0.521	0.528	0.528	0.433	0.393
141	Swaziland	0.170	0.302	0.289	0.303	0.324	0.345	0.395	0.413	0.466
142	Sweden	0.820	0.815	0.823	0.832	0.835	0.838	0.848	0.869	0.885
143	Switzerland	0.868	0.870	0.891	0.891	0.892	0.894	0.896	0.911	0.924
144	Syrian Arab Republic	0.516	0.435	0.563	0.560	0.447	0.335	0.297	0.462	0.367
145	Tajikistan	0.174	0.136	0.108	0.090	0.099	0.109	0.100	0.099	0.112
146	Tanzania, U. Rep. Of	0.055	0.056	0.059	0.057	0.054	0.051	0.040	0.043	0.045
147	Thailand	0.561	0.576	0.601	0.621	0.605	0.588	0.541	0.641	0.669
148	Togo	0.119	0.098	0.107	0.113	0.13	0.148	0.135	0.139	0.143
149	Trinidad and Tobago	0.675	0.647	0.659	0.667	0.633	0.593	0.613	0.858	0.941
150	Turkmenistan	0.350	0.322	0.358	0.238	0.226	0.213	0.260	0.345	0.410
151	Turkey	0.531	0.437	0.529	0.543	0.56	0.576	0.578	0.667	0.730
152	Uganda	0.081	0.086	0.135	0.147	0.130	0.113	0.103	0.113	0.118
153	Ukraine	0.521	0.335	0.278	0.240	0.231	0.222	0.329	0.357	0.395
154	United Arab Emirates	0.860	0.851	0.789	0.816	0.823	0.83	0.812	0.817	0.815
155	United Kingdom	0.805	0.806	0.824	0.832	0.840	0.848	0.844	0.863	0.877
156	United States	0.880	0.889	0.904	0.909	0.918	0.926	0.931	0.948	0.963
157	Uruguay	0.565	0.583	0.590	0.593	0.630	0.661	0.646	0.653	0.657
158	Uzbekistan	0.271	0.256	0.248	0.240	0.249	0.258	0.207	0.228	0.249
159	Vanuatu	0.197	0.255	0.231	0.256	0.307	0.359	0.321	0.559	0.287
160	Venezuela	0.643	0.639	0.632	0.631	0.642	0.652	0.555	0.542	0.554
161	Viet Nam	0.097	0.100	0.118	0.121	0.142	0.162	0.169	0.187	0.201
162	Yemen	0.245	0.159	0.075	0.080	0.078	0.075	0.066	0.075	0.084
163	Zambia	0.120	0.107	0.092	0.094	0.093	0.091	0.066	0.07	0.072
164	Zimbabwe	0.199	0.212	0.223	0.216	0.228	0.239	0.273	0.295	0.269

INDEX TABLE: VALUE OF HUMAN DEVELOPMENT INDEX FOR 1992-2000

HDI Report Year	1995	1996	1997	1998		1999	2000	2001	2002
Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
1 Albania	0.638	0.573	0.588	0.591	0.591	0.592	0.616	0.634	0.648
2 Algeria	0.608	0.636	0.627	0.668	0.646	0.612	0.636	0.652	0.657
3 Armenia	0.641	0.628	0.607	0.624	0.621	0.617	0.607	0.637	0.65
4 Angola	0.268	0.265	0.299	0.306	0.296	0.287	0.295	0.328	0.294
5 Antigua and Barbuda	0.712	0.736	0.777	0.783	0.785	0.787	0.793	0.785	0.792
6 Argentina	0.771	0.770	0.770	0.771	0.780	0.788	0.803	0.81	0.812
7 Australia	0.862	0.864	0.869	0.871	0.889	0.908	0.917	0.926	0.93
8 Austria	0.864	0.868	0.879	0.882	0.884	0.885	0.889	0.906	0.912
9 Azerbaijan	0.614	0.613	0.592	0.585	0.582	0.580	0.609	0.617	0.639
10 Bahamas	0.823	0.816	0.817	0.813	0.817	0.820	0.811	0.788	0.795
11 Bahrain	0.794	0.804	0.803	0.811	0.81	0.810	0.794	0.797	0.806
12 Bangladesh	0.334	0.347	0.345	0.348	0.344	0.341	0.358	0.367	0.375
13 Barbados	0.790	0.804	0.806	0.810	0.816	0.822	0.822	0.831	0.840
14 Belgium	0.865	0.871	0.88	0.882	0.897	0.912	0.914	0.926	0.932
15 Benin	0.291	0.301	0.336	0.349	0.337	0.326	0.32	0.328	0.329
16 Bhutan	0.283	0.291	0.309	0.317	0.345	0.372	0.377	0.376	0.385
17 Bolivia	0.517	0.532	0.531	0.540	0.548	0.557	0.539	0.544	0.549
18 Botswana	0.627	0.644	0.563	0.565	0.572	0.577	0.551	0.536	0.532
19 Brazil	0.660	0.672	0.667	0.677	0.688	0.699	0.709	0.711	0.718
20 Brunei Darussalam	0.813	0.815	0.853	0.863	0.862	0.861	0.819	0.856	0.853
21 Bulgaria	0.670	0.678	0.678	0.689	0.695	0.675	0.709	0.713	0.722
22 Burkina Faso	0.210	0.218	0.208	0.206	0.207	0.208	0.210	0.225	0.230
23 Burundi	0.268	0.289	0.233	0.225	0.226	0.228	0.228	0.213	0.216
24 Cambodia	0.301	0.348	0.342	0.402	0.407	0.412	0.409	0.436	0.438
25 Cameroon	0.436	0.452	0.419	0.429	0.424	0.420	0.412	0.387	0.394
26 Canada	0.905	0.907	0.917	0.919	0.919	0.919	0.925	0.926	0.931
27 Cape Verde	0.488	0.507	0.509	0.541	0.567	0.593	0.608	0.653	0.668
28 Central African Republic	0.324	0.305	0.323	0.310	0.289	0.268	0.263	0.261	0.263
29 Chad	0.270	0.258	0.263	0.286	0.286	0.286	0.271	0.260	0.265
30 Chile	0.760	0.767	0.776	0.785	0.798	0.810	0.784	0.784	0.791
31 China	0.531	0.554	0.564	0.588	0.599	0.609	0.615	0.636	0.652
32 Colombia	0.689	0.697	0.708	0.711	0.715	0.719	0.712	0.713	0.722
33 Comoros	0.371	0.371	0.377	0.379	0.387	0.396	0.398	0.397	0.399
34 Congo	0.455	0.463	0.444	0.471	0.449	0.426	0.403	0.405	0.411
35 Congo, Dem. Rep.	0.455	0.431	0.444	0.471	0.417	0.364	0.324	0.323	0.327
36 Costa Rica	0.743	0.741	0.744	0.747	0.747	0.747	0.741	0.773	0.772
37 Cote d' Ivoire	0.327	0.337	0.337	0.337	0.328	0.320	0.317	0.321	0.322
38 Cuba	0.663	0.652	0.648	0.657	0.663	0.668	0.701	0.717	0.728
39 Cyprus	0.829	0.830	0.818	0.827	0.833	0.839	0.860	0.847	0.854
40 Czech Republic	0.742	0.748	0.764	0.770	0.780	0.791	0.804	0.805	0.811

INDEX TABLE: VALUE OF HUMAN DEVELOPMENT INDEX FOR 1992-2000

HDI Report Year	1995	1996	1997	1998	1999	2000	2001	2002	
Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
41 Denmark	0.861	0.870	0.877	0.880	0.884	0.888	0.896	0.910	0.916
42 Djibouti	0.283	0.259	0.282	0.287	0.293	0.298	0.323	0.329	0.326
43 Dominica	0.672	0.639	0.735	0.744	0.733	0.707	0.738	0.722	0.721
44 Dominican Republic	0.615	0.620	0.635	0.646	0.657	0.668	0.669	0.674	0.681
45 Ecuador	0.659	0.668	0.676	0.675	0.683	0.691	0.627	0.631	0.625
46 Egypt	0.530	0.552	0.550	0.554	0.548	0.542	0.549	0.568	0.579
47 El Salvador	0.512	0.532	0.538	0.551	0.565	0.578	0.622	0.546	0.640
48 Equatorial Guinea	0.375	0.424	0.423	0.428	0.434	0.440	0.445	0.548	0.648
49 Estonia	0.724	0.665	0.679	0.671	0.698	0.720	0.759	0.734	0.790
50 Ethiopia	0.211	0.225	0.228	0.237	0.226	0.215	0.223	0.232	0.235
51 Fiji	0.718	0.725	0.728	0.734	0.722	0.689	0.701	0.704	0.702
52 Finland	0.871	0.872	0.881	0.886	0.893	0.898	0.905	0.914	0.921
53 France	0.875	0.877	0.894	0.896	0.898	0.901	0.900	0.909	0.914
54 Gabon	0.470	0.476	0.491	0.499	0.549	0.568	0.554	0.589	0.606
55 Gambia	0.267	0.265	0.263	0.276	0.285	0.294	0.298	0.303	0.309
56 Georgia	0.638	0.603	0.593	0.594	0.604	0.614	0.666	0.631	0.640
57 Germany	0.868	0.856	0.864	0.867	0.877	0.886	0.894	0.907	0.912
58 Ghana	0.420	0.431	0.420	0.427	0.428	0.430	0.441	0.426	0.432
59 Greece	0.791	0.803	0.827	0.830	0.832	0.833	0.844	0.852	0.858
60 Grenada	0.675	0.652	0.730	0.734	0.728	0.720	0.733	0.736	0.695
61 Guatemala	0.497	0.527	0.505	0.540	0.544	0.548	0.530	0.541	0.549
62 Guinea	0.217	0.270	0.245	0.252	0.272	0.292	0.290	0.278	0.272
63 Guinea Bissau	0.217	0.242	0.264	0.267	0.259	0.251	0.247	0.253	0.259
64 Guyana	0.559	0.577	0.580	0.594	0.597	0.599	0.612	0.554	0.622
65 Haiti	0.330	0.340	0.313	0.317	0.317	0.317	0.326	0.375	0.371
66 Honduras	0.521	0.533	0.530	0.531	0.534	0.536	0.549	0.530	0.535
67 Hong Kong, China (SAR)	0.848	0.857	0.862	0.856	0.855	0.855	0.842	0.850	0.861
68 Hungary	0.751	0.710	0.713	0.718	0.731	0.745	0.775	0.793	0.801
69 Iceland	0.866	0.872	0.886	0.888	0.894	0.899	0.911	0.919	0.925
70 India	0.412	0.423	0.425	0.428	0.437	0.445	0.463	0.474	0.481
71 Indonesia	0.548	0.568	0.585	0.597	0.594	0.591	0.567	0.576	0.586
72 Iran, Islamic Republic of	0.637	0.652	0.652	0.649	0.661	0.673	0.662	0.671	0.679
73 Ireland	0.829	0.844	0.860	0.867	0.874	0.879	0.889	0.902	0.914
74 Israel	0.829	0.831	0.838	0.841	0.850	0.858	0.857	0.870	0.875
75 Italy	0.843	0.845	0.856	0.860	0.869	0.877	0.881	0.889	0.894
76 Jamaica	0.628	0.630	0.652	0.657	0.650	0.642	0.643	0.648	0.653
77 Japan	0.878	0.881	0.885	0.887	0.897	0.907	0.904	0.909	0.915
78 Jordan	0.636	0.649	0.639	0.643	0.634	0.624	0.630	0.627	0.630
79 Kazakhstan	0.670	0.649	0.633	0.627	0.639	0.651	0.683	0.600	0.697
80 Kenya	0.436	0.443	0.425	0.424	0.414	0.404	0.395	0.400	0.398
81 Korea, Republic Of	0.771	0.779	0.790	0.799	0.813	0.826	0.827	0.850	0.859
82 Kuwait	0.696	0.787	0.790	0.801	0.806	0.810	0.814	0.787	0.781
83 Kyrgyz Stan	0.632	0.602	0.586	0.586	0.588	0.589	0.596	0.682	0.587

INDEX TABLE: VALUE OF HUMAN DEVELOPMENT INDEX FOR 1992-2000

HDI Report Year	1995	1996	1997	1998		1999	2000	2001	2002
Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
84 Lao People's Dem. Rep.	0.372	0.354	0.409	0.416	0.402	0.388	0.389	0.380	0.388
85 Latvia	0.712	0.704	0.629	0.628	0.644	0.660	0.718	0.743	0.661
86 Lebanon	0.601	0.593	0.691	0.698	0.711	0.703	0.670	0.702	0.690
87 Lesotho	0.441	0.459	0.429	0.438	0.453	0.468	0.454	0.429	0.424
88 Libyan Arab Jamahiriya	0.667	0.679	0.681	0.687	0.707	0.727	0.731	0.742	0.745
89 Lithuania	0.655	0.644	0.670	0.665	0.675	0.685	0.738	0.754	0.761
90 Luxembourg 50061	0.826	0.841	0.866	0.866	0.874	0.881	0.887	0.910	0.911
91 Madagascar	0.391	0.363	0.331	0.329	0.341	0.353	0.381	0.359	0.364
92 Malawi	0.306	0.311	0.315	0.333	0.328	0.322	0.318	0.323	0.323
93 Malaysia	0.698	0.714	0.716	0.722	0.723	0.723	0.725	0.764	0.774
94 Maldives	0.509	0.559	0.558	0.608	0.619	0.629	0.648	0.674	0.675
95 Mali	0.203	0.223	0.213	0.220	0.251	0.281	0.287	0.282	0.288
96 Malta	0.766	0.802	0.803	0.813	0.817	0.820	0.840	0.839	0.827
97 Mauritania	0.316	0.329	0.325	0.333	0.341	0.348	0.351	0.336	0.338
98 Mauritius	0.723	0.736	0.741	0.743	0.734	0.722	0.716	0.721	0.730
99 Mexico	0.713	0.715	0.723	0.719	0.731	0.742	0.737	0.746	0.754
100 Moldova, Republic of	0.650	0.608	0.566	0.566	0.566	0.566	0.584	0.584	0.587
101 Mongolia	0.531	0.528	0.572	0.583	0.542	0.501	0.513	0.466	0.532
102 Morocco	0.468	0.479	0.496	0.496	0.498	0.500	0.506	0.518	0.525
103 Mozambique	0.232	0.250	0.256	0.257	0.251	0.244	0.241	0.219	0.210
104 Myanmar	0.419	0.424	0.437	0.443	0.454	0.465	0.470	0.437	0.438
105 Namibia	0.528	0.522	0.517	0.576	0.586	0.596	0.590	0.557	0.569
106 Nepal	0.331	0.352	0.342	0.351	0.364	0.376	0.387	0.391	0.400
107 Netherlands	0.874	0.874	0.884	0.888	0.897	0.906	0.912	0.921	0.926
108 New Zealand	0.845	0.861	0.874	0.877	0.879	0.881	0.883	0.898	0.903
109 Nicaragua	0.536	0.526	0.500	0.514	0.515	0.516	0.530	0.535	0.537
110 Niger	0.189	0.194	0.194	0.196	0.201	0.206	0.205	0.185	0.188
111 Nigeria	0.365	0.382	0.365	0.382	0.370	0.358	0.338	0.353	0.358
112 Norway	0.874	0.885	0.895	0.899	0.906	0.914	0.924	0.930	0.935
113 Oman	0.643	0.637	0.636	0.672	0.681	0.690	0.694	0.717	0.721
114 Pakistan	0.385	0.400	0.405	0.416	0.412	0.408	0.421	0.395	0.398
115 Panama	0.710	0.720	0.724	0.731	0.738	0.745	0.722	0.734	0.736
116 Papua New Guinea	0.426	0.422	0.453	0.444	0.451	0.458	0.432	0.425	0.425
117 Paraguay	0.617	0.623	0.621	0.627	0.636	0.646	0.660	0.663	0.666
118 Peru	0.618	0.625	0.643	0.653	0.667	0.681	0.671	0.684	0.617
119 Philippines	0.601	0.605	0.612	0.621	0.638	0.656	0.661	0.671	0.679
120 Poland	0.714	0.712	0.727	0.733	0.742	0.751	0.769	0.786	0.794
121 Portugal	0.773	0.792	0.803	0.806	0.821	0.837	0.844	0.857	0.864
122 Qatar	0.797	0.801	0.782	0.786	0.790	0.795	0.802	0.781	0.783
123 Russian Federation	0.705	0.698	0.688	0.677	0.676	0.676	0.722	0.728	0.737
124 Rwanda	0.305	0.318	0.169	0.267	0.275	0.283	0.285	0.287	0.292

INDEX TABLE: VALUE OF HUMAN DEVELOPMENT INDEX FOR 1992-2000

HDI Report Year	1995	1996	1997	1998		1999	2000	2001	2002
Data Year	1992	1993	1994	1995	1996	1997	1998	1999	2000
125 Saint Kitts and Nevis	0.752	0.752	0.747	0.752	0.747	0.740	0.763	0.761	0.774
126 St. Vincent & the Grenadines	0.663	0.644	0.711	0.715	0.706	0.680	0.679	0.672	0.674
127 Samoa (Western)	0.593	0.627	0.619	0.629	0.641	0.653	0.633	0.615	0.662
128 Sao Tome and Principe	0.431	0.446	0.497	0.523	0.511	0.499	0.455	0.548	0.518
129 Saudi Arabia	0.662	0.688	0.669	0.668	0.685	0.701	0.708	0.719	0.724
130 Senegal	0.296	0.304	0.296	0.311	0.318	0.325	0.316	0.322	0.329
131 Seychelles	0.668	0.669	0.718	0.716	0.712	0.708	0.753	0.841	0.802
132 Sierra Leone	0.200	0.204	0.164	0.175	0.180	0.184	0.176	0.185	0.196
133 Singapore	0.813	0.821	0.845	0.844	0.858	0.871	0.860	0.853	0.863
134 Slovakia	0.734	0.721	0.732	0.743	0.754	0.765	0.782	0.790	0.796
135 Solomon Islands	0.455	0.509	0.508	0.513	0.515	0.518	0.506	0.509	0.506
136 South Africa	0.603	0.590	0.634	0.638	0.660	0.663	0.670	0.675	0.670
137 Spain	0.848	0.851	0.858	0.861	0.867	0.872	0.878	0.889	0.896
138 Sri Lanka	0.617	0.627	0.635	0.643	0.628	0.613	0.632	0.642	0.652
139 Sudan	0.332	0.345	0.306	0.317	0.340	0.364	0.364	0.341	0.385
140 Suriname	0.652	0.652	0.690	0.697	0.700	0.701	0.716	0.690	0.679
141 Swaziland	0.477	0.530	0.527	0.545	0.553	0.561	0.580	0.528	0.533
142 Sweden	0.864	0.866	0.872	0.876	0.892	0.908	0.913	0.925	0.931
143 Switzerland	0.872	0.875	0.884	0.884	0.888	0.892	0.895	0.887	0.892
144 Syrian Arab Republic	0.630	0.610	0.648	0.647	0.611	0.575	0.564	0.637	0.608
145 Tajikistan	0.582	0.578	0.544	0.543	0.547	0.551	0.549	0.545	0.551
146 Tanzania, U. Rep. Of	0.333	0.349	0.328	0.329	0.324	0.319	0.318	0.337	0.338
147 Thailand	0.675	0.686	0.692	0.702	0.699	0.695	0.684	0.722	0.733
148 Togo	0.386	0.377	0.345	0.421	0.396	0.372	0.374	0.391	0.395
149 Trinidad and Tobago	0.759	0.743	0.761	0.761	0.752	0.742	0.742	0.791	0.852
150 Turkmenistan	0.630	0.622	0.653	0.614	0.612	0.609	0.596	0.641	0.664
151 Turkey	0.643	0.621	0.657	0.660	0.668	0.677	0.680	0.714	0.717
152 Uganda	0.297	0.305	0.288	0.301	0.297	0.292	0.298	0.324	0.332
153 Ukraine	0.695	0.649	0.625	0.612	0.611	0.611	0.650	0.652	0.664
154 United Arab Emirates	0.821	0.815	0.804	0.793	0.793	0.793	0.790	0.788	0.790
155 United Kingdom	0.846	0.857	0.870	0.873	0.889	0.904	0.904	0.911	0.917
156 United States	0.900	0.905	0.911	0.914	0.916	0.918	0.920	0.927	0.933
157 Uruguay	0.742	0.748	0.748	0.752	0.768	0.783	0.781	0.785	0.788
158 Uzbekistan	0.626	0.600	0.603	0.612	0.613	0.614	0.582	0.593	0.619
159 Vanuatu	0.484	0.503	0.498	0.508	0.524	0.540	0.529	0.609	0.518
160 Venezuela	0.743	0.741	0.737	0.737	0.741	0.746	0.714	0.708	0.714
161 Viet Nam	0.490	0.498	0.514	0.518	0.532	0.546	0.554	0.567	0.574
162 Yemen	0.364	0.343	0.353	0.348	0.354	0.361	0.363	0.380	0.388
163 Zambia	0.380	0.376	0.336	0.347	0.334	0.321	0.317	0.322	0.334
164 Zimbabwe	0.481	0.491	0.462	0.462	0.456	0.451	0.452	0.453	0.445