THE QUESTION OF USING HUMAN DEVELOPMENT INDEX FOR DEVELOPING COUNTRIES CLASSIFICATION AND NEW METHODS OF CALCULATION WITH SPECIAL REGARD TO ENVIRONMENT

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Abstract

Gross domestic product (GDP) is nowadays the most common tool for measuring economic development and for international classification of countries worldwide. The paper presents some main disadvantages of GDP and shows, that Human development index (HDI) is more eligible for reason, that it includes both economic (represented by above mentioned GDP) and social part of human development. For that reason, the paper brings the newest values of HDI, which were counted (for the year 2005) according to the UNDP methodology, but which are independent from UNDP sources to compare 192 independent economics in the world, when United Nations Development Programme (UNDP) brings annually data for circa 175 countries only and new bounds for groups of countries were layout. Finally, the new methods of measuring the HDI components (DALE – new method of calculation life expectancy and GPI – new view on impact of economic development on the environment were taken into consideration and the HDI values were calculated.

Key words: socio-economic indicators; human developing index; classification of developing countries; economic impact on environment.

INTRODUCTION

GDP per capita is the measure most frequently used to represent the economic well-being of country's residents (Jeníček et al., 2005)[1]. This is neither complex nor satisfactory indicator to judge whether the examined country could be considered as developed one or not. Some (developing) countries' GDP per capita is higher than in developed countries, but the level of social development is manifold lower. This paper shows us, how quite comprehensive socio-economic indicators (represented by Human Development Index – HDI) help us to see the classification of developing countries from another (not only economic) point of view.

Gross domestic product

Since its introduction during WWII as a measure of wartime production capacity, the Gross National Product (now routinely measured as Gross Domestic Product – GDP) has become the nation's foremost indicator of economic progress (Todaro et al., 2005). It is the broadest quantitative measure of a nation's total economic activity and it is widely used by a majority of international organizations as the primary scorecard of economic classification.

Yet the GDP was never intended for this role. It is merely a gross tally of products and services bought and sold, with no distinctions between transactions that add to well-being, and those that diminish it. Instead of separating costs from benefits, and productive activities from destructive ones, the GDP assumes that every monetary transaction adds to well-being, by definition. It is as if a business tried to assess its financial condition by simply adding up all "business activity", thereby lumping together income and expenses, assets and liabilities (Cobb et al., 2004).

On top of this, the GDP ignores everything that happens outside the realm of monetized exchange, regardless of its importance to well-being. The crucial economic functions performed in the household and volunteer sectors go entirely ignored. The contributions of the natural habitat in providing the resources that sustain us go unreckoned as well. As a result, the GDP not only masks the breakdown of the social structure and natural habitat; worse, it actually portrays such breakdown as economic gain.

GDP ignores for example:

- GDP treats crime, divorce and natural disasters as economic gain.
- GDP ignores the non-market economy of household and community.
- GDP treats the depletion of natural capital as income.
- GDP increases with polluting activities and then again with clean-ups.
- GDP takes no account of income distribution
- GDP ignores the drawbacks of living on foreign assets

[1] Commonly used by World Bank, International Monetary Fund and others great international organizations.

Latest assessments of environmental impact of economic development in China represent almost 7 percentage of annual GDP.

Human development index

The HDI constitutes the first comprehensive attempt to measure achievements in development from a human perspective, expressed in terms of numerical indicators that permit inter-country and inter-temporal comparisons. The HDI combines in one composite index, indicators of health, education and income and intends to reflect achievements in the most basic human capabilities: living a long life, being knowledgeable and enjoying a decent standard of living[2] (UNDP, 2005; Todaro et al., 2005). HDI has been compiled annually by UNDP since 1987 and recently was calculated back to the year 1975[3].

UNDP give us the main components of HDI and their short overview and calculation:

Long and healthy life

The number of years a newborn baby would live if, at each age it passes through, the chances of his/her survival were the same as they were for that age group in the year of his/her birth. The change in this indicator reflects changes in the overall health of a country's population, in people's living conditions (environmental, economic and social) and in the quality of health care.

Index for life expectancy is as follows:

$$LE = (LE - LE_{min}) / (LE_{max} - LE_{min})$$

where: LE is the life expectancy at birth (in years)
LE_{max} = 85 years
LE_{min} = 25 years

Education

Literacy rate amongst adults is one part of educational index and presents the percentages of people aged 15 and over who can read, understand and write a short, straightforward text about their daily lives.

The second part of educational index is gross enrolment ratio, which presents the number of students enrolled in a level of education, regardless of age, as a percentage of the population of official school age for that level[4].

Index for education is as follows:

$$E = 2/3((LR - LR_{min}) / (LR_{max} - LR_{min})) + 1/3((Enrol - Enrol_{min}) / (Enrol_{max} – Enrol_{min}))$$

where: LR is literacy rate
LR_{min} = 0
LR_{max} = 100
Enrol is gross enrolment ratio
$Enrol_{min}$ = 0
$Enrol_{max}$ = 100

Standard of living

Standard of living is measured by per capita income, per capita GDP in Purchasing Power Parity (PPP)[5].

Index for standard of living:

$$SoF = (\log (GDP) – \log (GDP_{min})) / (\log (GDP_{max}) – (GDP_{min}))$$

where: GDP is the gross domestic product per capita in PPP
GDP_{min} = 100
GDP_{max} = 40000

HDI for all 192 countries was calculated according to this methodology. The minimum and maximum values adopted for life expectancy at birth, literacy rate, gross enrolment ratio and GDP are based on the values being used by UNDP in latest Human Development Report 2005.

Calculation of HDI using new data

As mentioned above, HDI index consists of 4 “pillars”, calculated by UNDP. Some new methods have appeared and the time is right to incorporate them into HDI formula.

DALE – Disability adjusted life expectancy

Previously, life expectancy estimates were based on the overall length of life based on mortality data only. For the first time, the WHO has calculated healthy life expectancy for babies born in 1999 based upon an indicator developed by WHO scientists, Disability Adjusted Life Expectancy (DALE). DALE summarizes the expected number of years to be lived in what might be termed the equivalent of “full health”. To calculate DALE, the years of ill-health are weighted according to severity and subtracted from the expected overall life expectancy to give the equivalent years of healthy life (Murray, 2000).

[2] Although the HDI is a very useful starting point, it is important to remember that the concept of human development is much broader and more complex than any summary measure can capture, even when supplemented by other indices.

[3] Some other attempts for calculating appear. Authors are attempting to calculate HDI back to the past – for European countries HDI was calculated e.g. for the year 1870 (Crafts et al.).

[4] The gross enrolment ratio can be greater than 100% as a result of grade repetition and entry at ages younger or older than the typical age at that grade level.

[5] Level of income is adjusted to the consumer prices of the different countries in the light of the PPP.

GPI – Genuine progress indicator

According to Australia Institute (Hamilton, 1997), the Genuine Progress Indicator (GPI) is a new measurement of the economic well-being of the nation[6]. It broadens the conventional accounting framework to include the economic contributions of the family and community realms, and of the natural habitat, along with conventionally measured economic production. The GPI takes into account more than twenty aspects of our economic lives that the GDP ignores. It includes estimates of the economic contribution of numerous social and environmental factors which the GDP dismisses with an implicit and arbitrary value of zero. It also differentiates between economic transactions that contribute to well-being and those which diminish it. The GPI then integrates these factors into a composite measure so that the benefits of economic activity can be weighed against the costs.

While per capita GDP has more than doubled from 1950 to present, the GPI shows a very different picture. It increased during the 1950s and 1960s, but has declined by roughly 45% since 1970. Further, the rate of decline in per capita GPI has increased from an average of 1% in the 1970s to 2% in the 1980s and to 6% so far in the 1990s. This wide and growing divergence between the GDP and GPI is a warning that the economy is stuck on a path that imposes large – and as yet unreckoned – costs onto the present and the future (Hamilton, 1997)[7].

Specifically, the GPI reveals that much of what economists now consider economic growth, as measured by GDP, is really one of three things:

1) fixing blunders and social decay from the past;
2) borrowing resources from the future; or
3) shifting functions from the community and household realm to that of the monetized economy.

The GPI strongly suggests that the costs of the nation's current economic trajectory have begun to outweigh the benefits, leading to growth that is actually uneconomic.

The GPI starts with the same personal consumption data the GDP is based on, but then makes some crucial distinctions. It adjusts for certain factors (such as income distribution), adds certain others (such as the value of household work and volunteer work), and subtracts yet others (such as the costs of crime and pollution). Because the GDP and the GPI are both measured in monetary terms, they can be compared on the same scale. For more details see the table 4 in the annex.

RESULTS

HDI for 192 countries was calculated. The results are shown in the following table 1. More details are available in tables 5 and 6 in the annex. This simplified table show, that if we use some new method of calculating HDI, the results would be completely different. According to HDI based on UNDP, 23 developing countries (namely from south Asia and Arab countries) will belong to the first group with highest HDI (0.8-1.0). When we add some new methods taking into account some negative aspects and impact of development on environment (using GPI) and more realistic view on term "healthy life" (using DALE), none of the developing countries will be considered as belonging into the first group with highest HDI. Nevertheless, the number of countries in the first group decreases anyway, including some non-developing countries.

Similar income, different HDI

Getting new results of HDI for 192 countries, we can easily compare these countries both according to HDI and GDP per capita in PPP. Table 2 bellow shows some examples of the differences in GDP rank compared to the HDI rank. Table 3 shows examples of some countries with similar value of income (GDP per capita in PPP), but with different value of HDI. From these tables we can clearly see the importance of social and environmental aspects in human development assessment[8].

[6] It has been measured since 1950 to present.

[7] Example from the USA (2003): GDP per capita $ 34.068, GPI per capita $ 10.346

[8] HDI and GDP in these tables are calculated without DALE and GPI.

Tab. 1. : HDI versus (new) HDI: Differences within groups of countries

HDI	HDI number of countries	Developing countries (%)	(new) HDI number of countries	Developing countries (%)
0.800-1.000	69	23 (33.33)	23	0 (0.00)
0.500-0.800	89	77 (86.52)	106	71 (66.98)
0.300-0.500	33	33 (100.00)	45	45 (100.00)
0.000-0.300	1	1 (100.00)	18	18 (100.00)

Note: (new) HDI means HDI calculated using DALE and GPI, while GPI was estimated as 35% of GDP.

Tab. 2. : Differences between GDP per capita in PPP rank and HDI rank

Positive		Negative		Equal	
Cuba	+45	Equatorial Guinea	-85	Italy	1
Tajikistan	+44	Botswana	-75	Laos	1
Marshall Islands	+43	South Africa	-65	Luxembourg	0
East Timor	+39	Nauru	-54	Norway	0
Bosnia and Herzegovina	+36	Swaziland	-49	Singapore	0
Jordan	+36	Namibia	-45	Canada	-1
Korea, North	+33	Gabon	-43	Somalia	-1

The last data column (GDP rank minus HDI rank) represents the difference found between a country's wealth and the actual development of its human resources. Countries with high, negative values for GDP rank minus HDI rank (such as Equatorial Guinea, Botswana, South Africa, Nauru, Gabon etc.) indicate a gap in translating the society's wealth into positive social development. Yet such high differences also indicate the potential for these countries to make strides in the currently lagging human development. On the other hand, countries with a large, positive GDP rank minus HDI rank (such as Cuba, Tajikistan, Marshall Islands, East Timor, Bosnia and Herzegovina etc.) show that the pace of social development has exceeded the pace of economic development, an encouraging indicator.

Tab. 3. : Similar income (GDP per capita), different HDI

Country A	GDP	HDI	Country B	GDP	HDI
Equatorial Guinea	23.154	0,703	Israel	22.944	0,917
South Africa	11.035	0,642	Costa Rica	10.316	0,835
Botswana	10.866	0,565	Russian Federation	11.209	0,818
Gabon	6.977	0,626	Dominican Republic	7.055	0,767
Swaziland	5.181	0,513	Serbia and Montenegro	5.204	0,794
Burundi	753	0,406	Yemen	745	0,489

CONSLUSION

A lot of attempts how to measure the impact of human development on environment have come and go. This paper shows how big differences would occur in international comparison, when we take into account the impact of human development on environment and that it is necessary to continue in calculating of such indicators (like for example Sustainable Human Development Index – see the annex).

This paper presents the unique calculation of HDI for 192 independent countries around the world, using the latest data and estimations from UN agencies and IMF and recalculation of these numbers with adding new important methods of measuring human development (DALE, GPI).

It is very difficult to measure precisely human development, but this paper shows that:

- we need more precise calculation of human development, due to its impact on environment;
- human development is not sustainable in many countries in the world and it will cause more problems in the future; and
- it is necessary to judge more critically the indicators of human development, but keep them be as much as simple for easy international/regional comparison.

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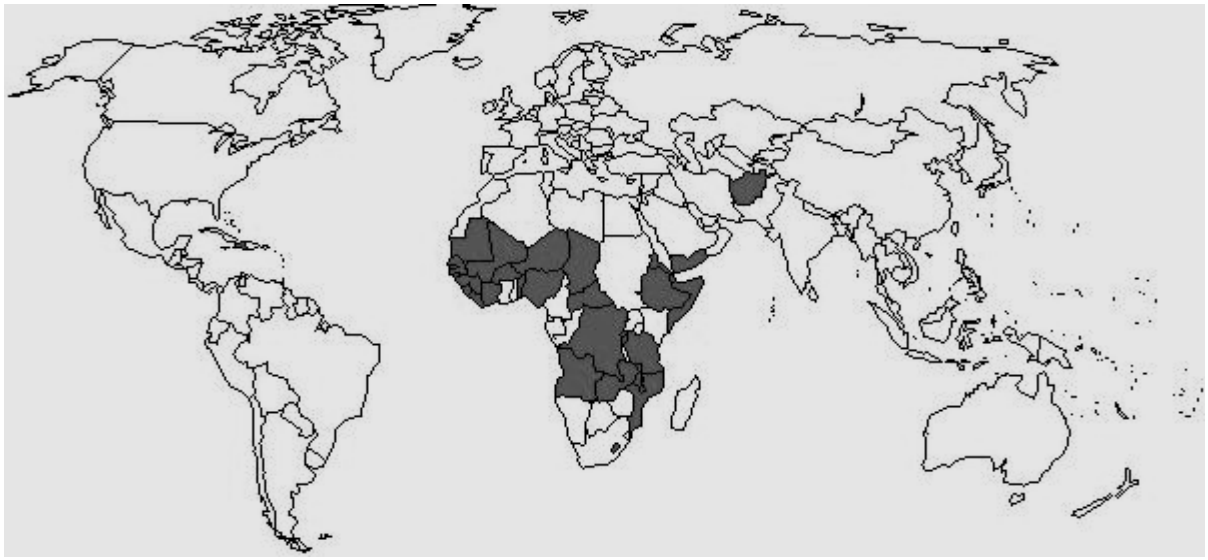
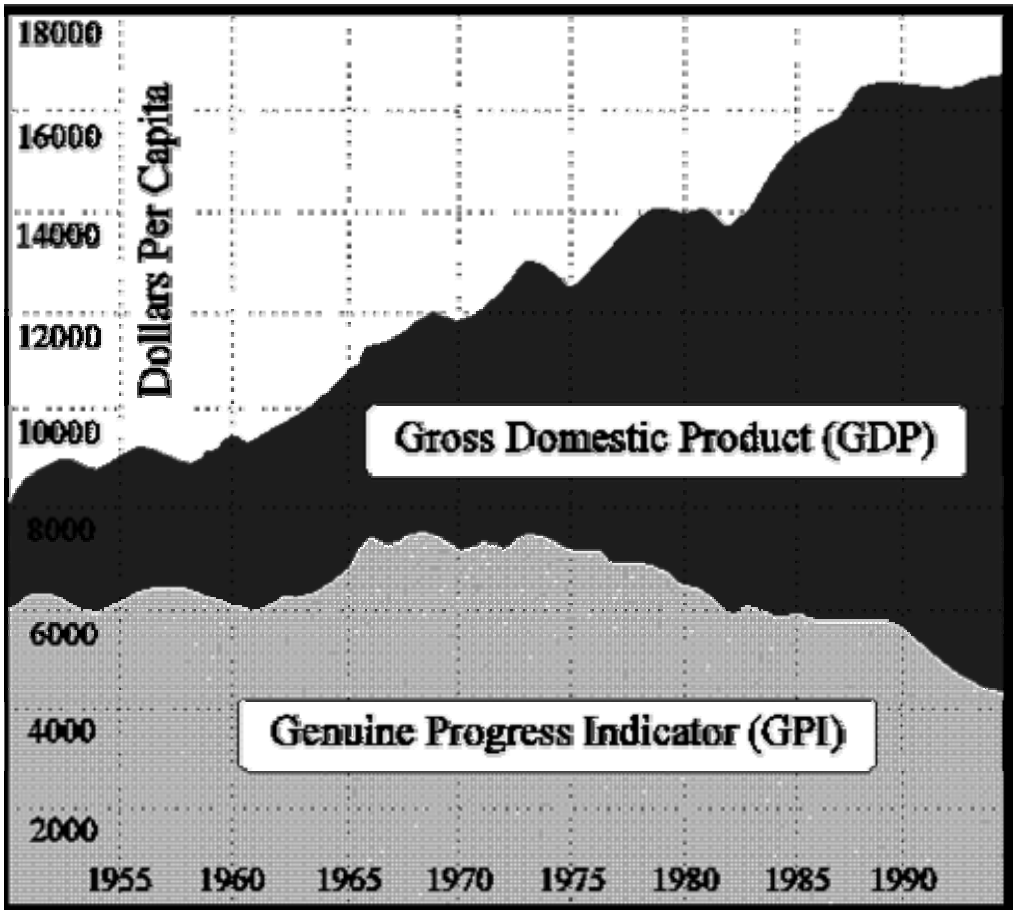
Map 1. : Countries with (new) HDI lower than 0.500



Scheme 1: Differences between GDP per capita growth and GPI growth



Source: Hamilton, 1997

Tab. 4. : GPI takes into account these factors of life (Hamilton, 1997)

Crime and Family Breakdown	Social breakdown imposes large economic costs on individuals and society, in the form of legal fees, medical expenses, damage to property, and the like. The GDP treats such expenses as additions to well-being. By contrast, the GPI subtracts the costs arising from crime and divorce.
Household and Volunteer Work	Much of the most important work in society is done in household and community settings: childcare, home repairs, volunteer work, and the like. These contributions are ignored in the GDP because no money changes hands. To correct this omission, the GPI includes, among other things, the value of household work figured at the approximate cost of hiring someone to do it.
Income Distribution	A rising tide does not necessarily lift all boats – not if the gap between the very rich and everyone else increases. Both economic theory and common sense tell us that the poor benefit more from a given increase in their income than do the rich. Accordingly, the GPI rises when the poor receive a larger percentage of national income, and falls when their share decreases.
Resource Depletion	If today's economic activity depletes the physical resource base available for tomorrows, then it is not really creating wellbeing; rather, it is just borrowing it from future generations. The GDP counts such borrowing as current income. The GPI, by contrast, counts the depletion or degradation of wetlands, farmland, and non-renewable minerals (including, oil) as a current cost.
Pollution	The GDP often counts pollution as a double gain; once when it's created, and then again when it is cleaned up. By contrast, the GPI subtracts the costs of air and water pollution as measured by actual damage to human health and the environment.
Long-Term Environmental Damage	Climate change and the management of nuclear wastes are two long-term costs arising from the use of fossil fuels and atomic energy. These costs do not show up in ordinary economic accounts. The same is true of the depletion of stratospheric ozone arising from the use of chlorofluorocarbons. For this reason, the GPI treats as costs the consumption of certain forms of energy and of ozone-depleting chemicals.
Changes in Leisure Time	As a nation increases in wealth, people should have increasing latitude to choose between more work and more free time for family or other activities. In recent years, however, the opposite has occurred. The GDP ignores this loss of free time, but the GPI treats leisure as most Americans do – as, something of value. When leisure time increases, the GPI goes up; when Americans have less of it, the GPI goes down.
Defensive Expenditures	The GDP counts as additions to well-being the money people spend just to prevent erosion in their quality of life or to compensate for misfortunes of various kinds. Examples are the medical and repair bills from automobile accidents, commuting costs, and household expenditures on pollution control devices such as water filters. The GPI counts such "defensive" expenditures as most Americans do: as costs rather than as benefits.
Lifespan of consumer Durables and Public Infrastructure	The GDP confuses the value provided by major consumer purchases (e.g., home appliances) with the amounts Americans spend to buy them. This hides the loss in well-being that results when products are made to wear out quickly. To overcome this, the GPI treats the money spent on capital items as a cost, and the value of the service they provide year after year as a benefit. This applies both to private capital items and to public infrastructure, such as highways.
Dependence on Foreign Assets	If a nation allows its capital stock to decline, or if it finances its consumption out of borrowed capital, it is living beyond its means. The GPI counts net additions to the capital stock as contributions to well-being, and treats money borrowed from abroad as reductions. If the borrowed money is used for investment, the negative effects are cancelled out. But if the borrowed money is used to finance consumption, the GPI declines.

Tab. 5. : Human development index (2005)

High human development		
1	Luxembourg	0,980
2	Norway	0,972
3	United Kingdom	0,971
4	Sweden	0,971
5	Belgium	0,962
6	Iceland	0,962
7	Australia	0,962
8	Finland	0,957
9	Canada	0,955
10	San Marino	0,953
11	Denmark	0,953
12	Switzerland	0,951
13	United States	0,947
14	Netherlands	0,947
15	Ireland, Republic of	0,947
16	Japan	0,945
17	New Zealand	0,943
18	France	0,941
19	Austria	0,939
20	Italy	0,936
21	Monaco	0,935
22	Liechtenstein	0,933
23	Spain	0,932
24	Andorra	0,931
25	Singapore	0,931
26	Germany	0,918
27	Israel	0,917
28	Taiwan (Republic of China)	0,916
29	Korea	0,911
30	Slovenia	0,910
31	Greece	0,904
32	Portugal	0,898
33	Cyprus	0,893
34	Malta	0,888
35	Czech Republic	0,888
36	Qatar	0,876
37	Argentina	0,876
38	Brunei	0,874
39	Lithuania	0,874
40	Barbados	0,871
41	Poland	0,870
42	Estonia	0,868
43	Hungary	0,868
44	Slovakia	0,862
45	Saint Kitts and Nevis	0,856
46	Chile	0,855
47	Uruguay	0,853
48	Latvia	0,848
49	Croatia	0,845
50	Bahrain	0,842
51	Kuwait	0,840
52	Libyan Arab Jamahiriya	0,840
53	United Arab Emirates	0,838
54	Costa Rica	0,835
55	Seychelles	0,826
56	Mexico	0,824
57	Bulgaria	0,818
58	Russian Federation	0,818
59	Bahamas	0,815
60	Panama	0,812
61	Belarus	0,807
62	Palau	0,805
63	Bosnia and Herzegovina	0,804
64	Macedonia, Republic of	0,804
65	Mauritius	0,803
66	Ukraine	0,803
67	Romania	0,802
68	Brazil	0,801
69	Tonga	0,801

Medium human development		
70	Antigua and Barbuda	0,799
71	Malaysia	0,799
72	Trinidad and Tobago	0,799
73	Dominica	0,798
74	Jordan	0,798
75	Thailand	0,795
76	Serbia and Montenegro	0,794
77	Saint Vincent and the Gren.	0,792
78	Venezuela	0,791
79	Saudi Arabia	0,790
80	Kazakhstan	0,790
81	Oman	0,789
82	Samoa	0,786
83	Cuba	0,784
84	Colombia	0,783
85	Grenada	0,782
86	Paraguay	0,781
87	Albania	0,780
88	Ecuador	0,779
89	Belize	0,777
90	Saint Lucia	0,777
91	Lebanon	0,776
92	Turkey	0,775
93	China, People's Republic of	0,771
94	Tunisia	0,770
95	Dominican Republic	0,767
96	Fiji	0,767
97	Armenia	0,764
98	Peru	0,763
99	Philippines	0,761
100	Maldives	0,758
101	Jamaica	0,757
102	Sri Lanka	0,757
103	Georgia	0,753
104	Suriname	0,749
105	Turkmenistan	0,748
106	Iran, Islamic Republic of	0,747
107	Guyana	0,744
108	Algeria	0,742
109	Cape Verde	0,734
110	El Salvador	0,723
111	Azerbaijan	0,721
112	Indonesia	0,720
113	Kyrgyzstan	0,719
114	Micronesia, Federated States of	0,713
115	Vietnam	0,710
116	Nauru	0,708
117	Bolivia	0,706
118	Korea, People's Republic of	0,705
119	Equatorial Guinea	0,703
120	Marshall Islands	0,695
121	Syrian Arab Republic	0,693
122	Mongolia	0,687
123	Kiribati	0,686
124	Moldova	0,686
125	Uzbekistan	0,685
126	Egypt	0,675
127	Tajikistan	0,671
128	Honduras	0,670
129	Guatemala	0,667
130	Tuvalu	0,665
131	Nicaragua	0,663
132	Solomon Islands	0,656
133	South Africa	0,642
134	Morocco	0,641
135	São Tame and Principe	0,634
136	Vanuatu	0,633
137	Gabon	0,626
138	India	0,612
139	Namibia	0,604
140	Iraq	0,600
141	Myanmar/Burma	0,589
142	Papua New Guinea	0,588
143	Cambodia	0,587
144	Ghana	0,580
145	Botswana	0,565
146	Cameroon	0,555
147	Laos	0,550
148	Uganda	0,547
149	Comoros	0,542
150	Sudan	0,541
151	Togo	0,541
152	Pakistan	0,539
153	Congo, Republic of	0,536
154	Bangladesh	0,527
155	Zimbabwe	0,518
156	East Timor	0,518
157	Swaziland	0,513
158	Nepal	0,511
159	Madagascar	0,510
160	Kenya	0,509
161	Bhutan	0,508

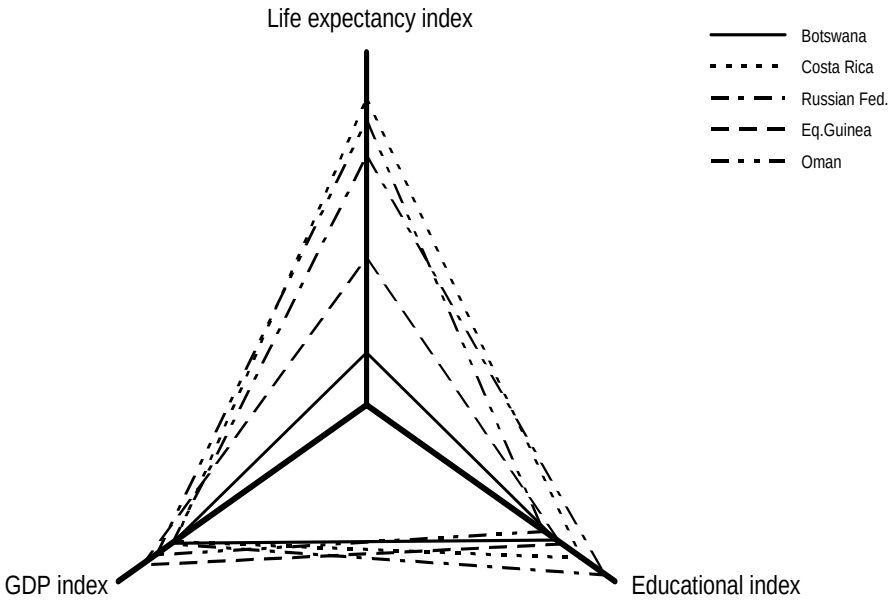
Low human development		
162	Yemen	0,489
163	Rwanda	0,488
164	Senegal	0,486
165	Lesotho	0,486
166	Haiti	0,481
167	Nigeria	0,480
168	Eritrea	0,479
169	Mauritania	0,471
170	Gambia, The	0,469
171	Djibouti	0,444
172	Angola	0,442
173	Tanzania, United Republic of	0,441
174	Côte d'Ivoire	0,441
175	Congo, Democratic Republic of	0,439
176	Zambia	0,437
177	Chad	0,430
178	Guinea	0,427
179	Benin	0,425
180	Malawi	0,410
181	Burundi	0,406
182	Mali	0,402
183	Liberia	0,395
184	Central African Republic	0,387
185	Ethiopia	0,386
186	Mozambique	0,383
187	Guinea-Bissau	0,375
188	Burkina Faso	0,360
189	Afghanistan	0,340
190	Somalia	0,334
191	Sierra Leone	0,321
192	Niger	0,287

Tab. 6. : Human Development Index (2005), including DALE and GPI

High human development		
1	Australia	0,869
2	Luxembourg	0,869
3	United Kingdom	0,865
4	Sweden	0,861
5	Norway	0,860
6	Belgium	0,854
7	Finland	0,844
8	Canada	0,841
9	Netherlands	0,840
10	Japan	0,839
11	Denmark	0,838
12	Iceland	0,838
13	Switzerland	0,838
14	France	0,836
15	United States	0,835
16	Ireland, Republic of	0,833
17	San Marino	0,832
18	Austria	0,829
19	Italy	0,828
20	Monaco	0,826
21	Spain	0,825
22	Liechtenstein	0,821
23	New Zealand	0,821
24	Germany	0,820
25	Greece	0,813
26	Andorra	0,800
Medium human development		
27	Israel	0,799
28	Slovenia	0,798
29	Singapore	0,793
30	Taiwan (Republic of China)	0,784
31	Portugal	0,783
32	Cyprus	0,779
33	Korea	0,775
34	Czech Republic	0,774
35	Malta	0,772
36	Barbados	0,760
37	Argentina	0,755
38	Poland	0,753
39	Hungary	0,752
40	Estonia	0,750
41	Qatar	0,750
42	Lithuania	0,750
43	Slovakia	0,749
44	Brunei	0,747
45	Chile	0,741
46	Croatia	0,734
47	Uruguay	0,734
48	Bahrain	0,732
49	Latvia	0,730
50	Grenada	0,728
51	Saint Kitts and Nevis	0,728
52	Trinidad and Tobago	0,718
53	Russian Federation	0,716
54	United Arab Emirates	0,715
55	Bahamas	0,711
56	Costa Rica	0,709
57	Bulgaria	0,707
58	Dominica	0,702
59	Belarus	0,699
60	Mexico	0,698
61	Ukraine	0,697
62	Antigua and Barbuda	0,696
63	Tonga	0,695
64	Kuwait	0,694
65	Panama	0,691
66	Seychelles	0,687
67	Romania	0,683
68	Saint Vincent and the Gren.	0,682
69	Mauritius	0,680
70	Macedonia, Republic of	0,679
71	Serbia and Montenegro	0,677
72	Libyan Arab Jamahiriya	0,675
73	Palau	0,675
74	Belize	0,672
75	Malaysia	0,671
76	Venezuela	0,670
77	Armenia	0,668
78	Cuba	0,666
79	Colombia	0,665
80	Kazakhstan	0,664
81	Oman	0,664
82	Bosnia and Herzegovina	0,663
83	Brazil	0,662
84	Thailand	0,661
85	Saudi Arabia	0,660
86	Samoa	0,660
87	Saint Lucia	0,660
88	Jamaica	0,655
89	Azerbaijan	0,654
90	Turkey	0,653
91	Georgia	0,649
92	Dominican Republic	0,649
93	China, People's Republic of	0,646
94	Paraguay	0,646
95	Guyana	0,646
96	Suriname	0,645
97	Fiji	0,642
98	Lebanon	0,640
99	Turkmenistan	0,639
100	Peru	0,637
101	Maldives	0,632
102	Philippines	0,631

103	Sri Lanka	0,630
104	Jordan	0,628
105	Tunisia	0,626
106	Iran, Islamic Republic of	0,625
107	Ecuador	0,625
108	Albania	0,615
109	Algeria	0,609
110	Equatorial Guinea	0,603
111	El Salvador	0,600
112	Moldova	0,596
113	Indonesia	0,595
114	Cape Verde	0,594
115	Uzbekistan	0,593
116	Micronesia, Federated States of	0,588
117	Kyrgyzstan	0,584
118	Nauru	0,582
119	Kiribati	0,581
120	Vietnam	0,572
121	Bolivia	0,569
122	Syrian Arab Republic	0,562
123	Tajikistan	0,561
124	Mongolia	0,558
125	Honduras	0,555
126	South Africa	0,553
127	Marshall Islands	0,552
128	Tuvalu	0,536
129	Egypt	0,536
130	Korea, People's Republic of	0,530
131	Nicaragua	0,526
132	Guatemala	0,525
133	Gabon	0,516
134	Morocco	0,511
135	Vanuatu	0,510
Low human development		
136	São Tomé and Principe	0,490
137	Namibia	0,489
138	Solomon Islands	0,488
139	Botswana	0,487
140	India	0,480
141	Swaziland	0,471
142	Myanmar/Burma	0,469
143	Iraq	0,457
144	Cambodia	0,445
145	Ghana	0,443
146	Cameroon	0,437
147	Laos	0,431
148	Pakistan	0,430
149	Lesotho	0,430
150	Congo, Republic of	0,427
151	Bhutan	0,423
152	Papua New Guinea	0,419
153	Zimbabwe	0,415
154	East Timor	0,399
155	Kenya	0,392
156	Bangladesh	0,390
157	Comoros	0,388
158	Sudan	0,386
159	Nepal	0,385
160	Togo	0,381
161	Uganda	0,373
162	Angola	0,371
163	Gambia, The	0,369
164	Nigeria	0,365
165	Haiti	0,361
166	Yemen	0,352
167	Djibouti	0,346
168	Rwanda	0,340
169	Côte d'Ivoire	0,339
170	Mauritania	0,339
171	Senegal	0,338
172	Madagascar	0,328
173	Tanzania, United Republic of	0,321
174	Chad	0,318
175	Zambia	0,316
Very low human development		
176	Liberia	0,299
177	Benin	0,298
178	Eritrea	0,294
179	Guinea	0,294
180	Congo, Democratic Republic of	0,288
181	Mozambique	0,281
182	Central African Republic	0,276
183	Malawi	0,274
184	Guinea-Bissau	0,253
185	Burundi	0,250
186	Mali	0,247
187	Afghanistan	0,242
188	Ethiopia	0,232
189	Burkina Faso	0,219
190	Somalia	0,200
191	Sierra Leone	0,174
192	Niger	0,138

Chart 1:Comparison of HDI components (five countries with different indexes are included in this chart)



SHDI – Sustainable Human Development Index

Recent analysis leads to the conclusion that the indicated human development of many countries is potentially unsustainable. Most of these countries have a low HDI, which means that even this low achievement is not sustainable into the future. Armenian scientists introduced the Sustainable Human Development Index (SHDI) in the NHDR 1995, Armenia[9].

Each level of society's economic activity implies certain change in the environment (as a result of negative impact) and a system of measures aimed at securing and improving the natural environment. It is assumed that the integral indicator of natural environmental situation (A) and state policy in nature protection (B) may be observed as the forth equal component of SHDI. In this case the components for SHDI are life expectancy index; adult literacy index; adjusted GDP index and the environmental situation index divided by four. SHDI for 2000 make up:

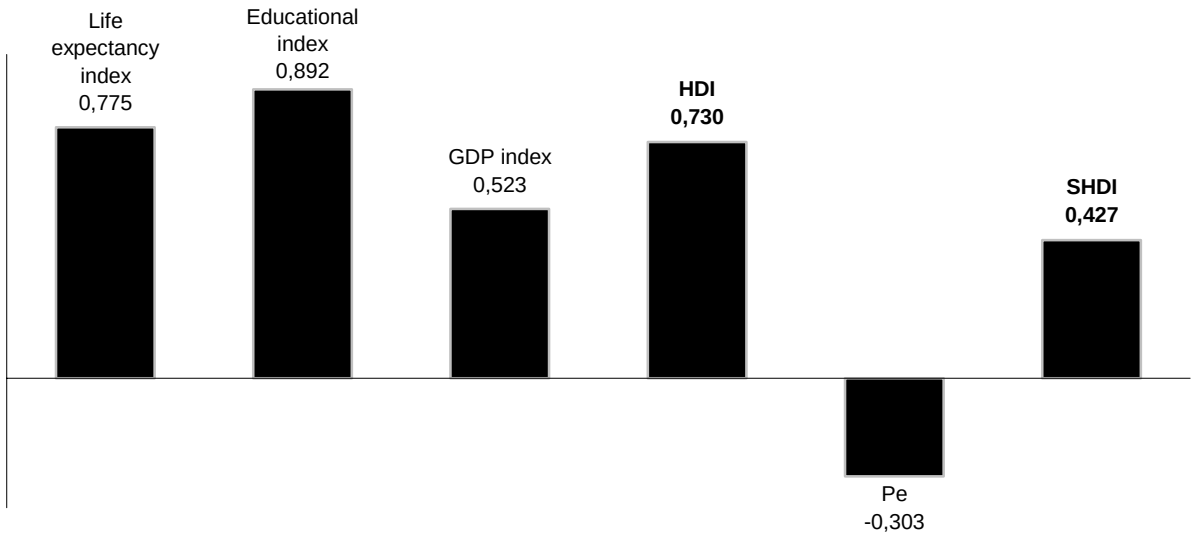
Country environmental situation indicator A = -0.303; economic activities' environmental indicator[a] B = -0.304 which sum up to make the integral coefficient of environmental change Pe = -0.303. SHDI dynamics is as follows:

Tab. 7. : Armenia: Sustainable human development index

	1990	1997	1998	1999	2000
HDI	0,831	0,728	0,721	0,729	0,730
Pe	-0,362	-0,292	-0,294	-0,301	-0,303
SHDI	0,533	0,475	0,479	0,472	0,472

[9] Presented at the International Conference on Sustainable Human Development of Countries with Economies in Transition, Minsk (16 - 18 April, 1997), Baku (May 1999), Bangkok (2001).

Chart 2: Getting SHDI by implementing the coefficient of environmental change (Pe) into HDI: Armenia (2000)



Source(s): UNDP, Human Development Report 2003 and NHDR Armenia 2003