SOCIAL DEVELOPMENT IN MEGADIVERSE COUNTRIES

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Abstract

Mexico bebngs to the select elite of the 17 megadiverse countries of the world, which have, because of their geographic position, environmental features, and history, an enormous amount of different kinds of organisms. These countries (Australia, Brazil, China, Colombia, Ecuador, India, Indonesia, the Philippines, Madagascar, Malaysia, Mexico, Papua New Guinea, Peru, Republic of the Congo, South Africa, Venezuela, USA) host between 60 and 70% of the Earth's biodiversity. Unfortunately, most of them are considered undeveloped countries, whose inhabitants lack adequate food and shelter, education and health care. These living conditions produce social conflicts which threaten biological diversity, consequently reducing opportunities for social development. This study was conducted with the objective of comparing human living conditions in the 17 megadiverse countries by analysing information from the World Development Report 2000/2001 by the World Bank. We found that the 17 megadiverse countries contain 3,282 million people, and only USA and Australia, with 8.6% of this population, have an annual gross national product income > US $20,000 per capita, belonging to group of high income country. While India, Indonesia, Madagascar, and the Republic of Congo with 1,273,000 people (38.2% of megadiverse countries) have an average income less than US $488 per capita, belonging, on the contrary to the low income countries group. Finally, the middle income group (US $756-9,265 per capita) with 1,765,000 people, includes- besides China, South Africa and Malaysia- all 6 of the megadiverse countries of Latin America. Economic and social development, and poverty eradication are the first and overriding priorities of developing countries, determined to conserve and sustainably use biological diversity for the benefit of present and future generations

Introduction

Biodiversity is defined as organism variety considered at all levels, from genetics variation within a species, genus, families, and even higher taxonomical levels, including ecosystems (Wilson 1992). According to Cincotta & Engelman (2000), approximately 1.5 million of species have been identified worldwide. However, this species count represents only around 10% of species currently existing in the planet, which is estimated to be between
7 million and 15 million species. Moreover, according to Sahrukán (1999), information is available for just 150,000 of all existing species (representing barely 1% of all estimated biodiversity in existence), concerning their status in nature

Tropical rain forests, covering 2.3% of the world´s surface area, are located mainly in Latin America, Africa and Asia. These ecosystems include 50% of all estimated species in existence, and unfortunately, 90% of all annual human births occur in these regions (Cincotta & Engelman 2000).

Mitermeier and Goettsch (1997) recognised 17 megadiverse countries according to their species richness, endemisms and ecosystems: Australia, Brazil, China, Colombia, Ecuador, India, Indonesia, Philippines, Madagascar, Malaysia, Mexico, Papua New Guinea, Peru, the Republic of the Congo, South Africa, Venezuela, USA, including 75% of all known species of vascular plants and terrestrial species of fauna in the world. Current trends of population growth and species extinction rate indicate that for the next 30 years the human impact on natural resources and biodiversity will increase dramatically (World Bank 2001).

Objective

This study was conducted in order to analyse human welfare indicators and biodiversity condition of the 17 megadiverse countries, as outlined in the World Development Report 2000/2001 (World Bank 2001).

Results

Social and Economic Aspects

All 17 megadiverse countries covered 39% of the emerged earth surface, and were inhabited by 3,282 million people which represents 55% of the world´s population. In the developed countries, Australia and USA, live 292 million people, whereas in the remaining 15 megadiverse countries, 3,038 million people are concentrated. The population density per sq. km. of Australia and USA was 16 people. The next 15 undeveloped megadiverse countries showed 8l people per km^2. The average annual population growth rate during 1990-1999 of Australia and USA was 1.1%, while the remaining 15 megadiverse countries showed 2.2% average annual growth rate during this same period. According to the per capita gross national product as an indicator of social development, the World Bank (2001) defined three development categories for 134 analysed countries. High income category, include 46 countries whose annual per capita income per capita is > US $2,700; the middle income category included 39 countries with a yearly income per capita between $650 and $2,700; and finally the low income group included 47 countries whose income is lower than $650 per year. The USA and Australia are developed countries with a yearly income per individual of US $30,600 and US $20,050, respectively. The rest of megadiverse countries are considered developing countries. However, Brazil, Colombia, China, Ecuador, Mexico, Peru, Malaysia, the Philippines, Venezuela and Papua New Guinea, belong to the middle income category with an annual average income of US$ 2,680 per capita; whereas India, Madagascar, the Democratic Republic of the Congo, and Indonesia showed an average income of US$ 488 per capita, belong to the group of low income countries (Table 1).

Table 1. Population, surface and gross national product of megadiverse countries.

Nr.	Country	Population				Surface		Gross National Product per capita
		Millions		Avg. Annual growth rate (%)	Density People per sq. Km	Thousands of sq. Km		Dollars
		1999	%	1990-99	1999	1999	%	1999
1	Australia *	19	0,3	1,2	2	7,741	5,8	20,050
2	USA *	273	4,6	1	30	9,364	7,0	30,600
3	Brazil **	168	2,8	1,4	20	8,547	6,4	4,420
4	Colombia **	42	0,7	1,9	40	1,139	0,9	2,250
5	China **	1,25	20,9	1,1	134	9,597	7,2	780
6	Ecuador **	12	0,2	2,1	45	284	0,2	1,310
7	Mexico **	97	1,6	1,8	51	1,958	1,5	4,400
8	Peru **	25	0,4	1,7	20	1,285	1,0	2,390
9	Malaysia **	23	0,4	2,5	69	330	0,2	3,400
10	South Africa **	42	0,7	2	34	1,221	0,9	3,160
11	Venezuela **	24	0,4	2,2	27	912	0,7	3,670
12	Papua New Guinea **	5	0,1	2,3	10	463	0,3	3.7
13	Philippines **	77	1,3	2,3	258	300	0,2	1,020
14	India ***	998	16,7	1,8	336	3,288	2,5	450
15	Indonesia ***	207	3,5	1,7	114	1,905	1,4	580
16	Madagascar ***	15	0,3	2,9	26	587	0,4	250
17	Republic of Congo 1 ***	53	0,9	6	30	2,687	2,0	670
	World	**5,975**		**1.0w**	**46w**	**133,572**		**4890w**
	HIGH Income *	292	4,9	1,1	16	17,105	12,8	25,325
	MIDDLE Income **	1765	29,5	1,9	64,4	26,036	19,5	2,68
	LOW Income ***	1273	21,3	3,1	126,5	8,467	6,3	487,5
	MIDDLE & LOW Income	3038	50,8	2,2	80,9	34,503	25,8	2,053,6

1 Includes Democratic Republic of the Congo and Republic of the Congo
w weighted average

Life expectancy at birth of megadiverse countries populations showed a 19 year difference between the average values of high income and low income countries. On the other hand, an under-5 year mortality rate was observed for the developed megadiverse countries (0.6%), whereas for the remaining 15 developing megadiverse countries the figure 6.8% was observed to be true. Regarding the adult illiteracy rate of megadiverse countries, no data exists for Australia and USA, while the 15 remaining developing countries exhibit 39%. The public expenditure on health in developed megadiverse countries was 6% of gross national product. On the other hand, the developing megadiverse countries expenditure on health was 2.5% of gross national product. In relation to the poverty indicator, 15.7% of people from middle income megadiverse countries, live on less than 1 dollar a day. Whereas 39.9% of people in low income megadiverse countries live on less than a dollar a day (Table 2).

Table 2. Life expectancy, mortality rate, illiteracy rate, public expenditure on health and povrety of megadiverse countries

		Life expectancy at birth (years)		Under-5 mortality rate per 1,000	Adult Illiteracy Rate % of people 15 and above 1998		Public Expenditure on Health	Poverty population below
		1998	1998					
Nr.	Country	Males	Females	1998	Males	Females	% of GNP	1 Dll a day
1	Australia *	76	82	6	---	---	5.5	---
2	USA *	74	80	---	---	---	6.5	---
3	Brazil **	63	71	40	16	16	3.4	5.1
4	Colombia **	67	73	28	9	9	4.9	11
5	China **	68	72	36	9	25	2.0	18.5
6	Ecuador **	68	73	37	8	11	2.5	20.2
7	Mexico **	69	75	35	7	11	2.8	17.9
8	Peru **	66	71	47	6	16	2.2	15.5
9	Malaysia **	70	75	12	9	18	1.3	---
10	South Africa **	61	66	83	15	16	2.2	11.5
11	Venezuela **	70	76	25	7	9	3.2	14.7
12	Papua New Guinea **	57	59	76	29	45	2.6	---
13	Philippines **	67	71	40	5	5	6.9	26.5
14	India ***	62	64	83	33	57	0.6	44.2
15	Indonesia ***	64	67	52	9	20.0	0.6	15.2
16	Madagascar ***	56	59	146	28	42	1.1	60.2
17	Republic of Congo 1 ***	49	52	284	43	82	1.2	---
	World	**65w**	**69w**	**75w**	**18w**	**32w**	2.5w	---
	HIGH Income *	75	81	6	---	---	6	---
	MIDDLE Income **	66	71,1	41,7	10,9	16,5	3.1	12.8
	LOW Income ***	57,8	60,5	141,3	28,3	50,3	0.9	29.9
	MIDDLE & LOW Income	63,8	68,3	68,3	15,5	25,5	2.5	17.4

1 Includes Democratic Republic of the Congo and Republic of the Congo
w weighted average

The external debt of middle income megadiverse countries was 781,660 million dollars, and for the low income megadiverse countries it was 271,549 million dollars, which represents 46% and 188.5% of their average gross national product, respectively (Table 3).

Table 3. External debt, carbon dioxide emissions, annual deforestation and nationally protected areas of megadiverse countries.

Nr.	Country	External debt 1998		Carbon dioxide emissions 1996		Annual deforestation		Nationally Protected Areas 1996	
		Total Millions of dollars	Present value % of GNP	Total Million metric tons	Per capita Metric tons	1990-1995 Square kilometers	Avg.annual % change	Thousand square km	% of total land area
1	Australia *	---	---	306,6	16,7	-170	0	563,9	7,3
2	USA *	---	---	5,301	20	-5,886	-0,3	1226,7	13,4
3	Brazil **	232,004	29	273,4	1,7	25,544	0,5	355,5	4,2
4	Colombia **	33,263	32	65,3	1,7	2,622	0,5	93,6	9,0
5	China **	154,599	15	3,363,5	2,8	866	0,1	598,1	6,4
6	Ecuador **	15,14	75	24,5	2,1	1,89	1,6	119,3	43,1
7	Mexico **	159,959	39	348,1	3,8	5,08	0,9	71,0	3,7
8	Peru **	32,397	55	26,2	1,1	2,168	0,3	34,6	2,7
9	Malaysia **	44,773	69	119,1	5,6	4,002	2,4	14,8	4,5
10	South Africa **	24,712	18	292,7	7,3	150	0,2	65,8	5,4
11	Venezuela **	37,003	40	144,5	6,5	5,034	1,1	319,8	36,3
12	Papua New Guinea **	2,692	69	0.6	0.5	1,332	0,4	0.1	0.0
13	Philippines **	47,817	66	63,2	0,9	2,624	3,5	14,5	4,9
14	India ***	98,232	20	997,4	1,1	-72	0	142,9	4,8
15	Indonesia ***	150,875	169	245,1	1,2	10,844	1	192,3	10,6
16	Madagascar ***	4,394	89	1,2	0,1	1,300	0,8	11,2	1,9
17	Republic of Congo 1 ***	18,048	476	7,3	2	416	0,2	117,3	9,0
	World	...		22,690.1t	4.0w	101,724w	0.3w	8543.5w	6.6w
	HIGH Income *	---	---	5,607.6	18,4	-6,056	-0,15	895,3	10,4
	MIDDLE Income **	71,060,9	46,1	4,720,5	3,4	49,981,332	1,1	168,7	12,0
	LOW Income ***	67,887,3	188,5	1,251	1,1	12,488	0,5	115,9	6,6
	MIDDLE & LOW Income	70,214,6	84,1	5,971,5	2,7	62,469,3	0,9	153,6	10,5

1 Includes Democratic Republic of the Congo and Republic of the Congo
w weighted average

Environmental Aspects

The carbon dioxide emissions of developed megadiverse countries was 5,608 million metric tons, 95% of them corresponding to USA; while the total carbon dioxide emission of developing megadiverse countries was 5,972 million metric tons. In relation to carbon dioxide emissions per capita the high income countries produced 18.7 metric tons, whereas the developing countries produced an average of 2.7 metric tons per individual. According to the World Development Report (World Bank 2001), regarding annual deforestation rate, Australia and USA showed negative values, which means they created forest plantations instead of deforestating. On the contrary, 49,981 sq. km were deforested in middle income megadiverse countries; whereas the low income megadiverse countries showed a 12,488 km^2 annual deforestation rate. In relation to nature reserves, high income megadiverse countries had protected 10.4% of their surface areas, while the middle income countries had 12% of their surface areas under protection. Finally, the low income countries had preserved 6.6% of their territory in nature reserves (Table 3).

Complementary information regarding existing species of plants and terrestrial vertebrates of megadiverse countries (Mittermeir and Goetsch 1997), and the list of their threatened species (IUCN 1996, 1997), are presented in tables 4 and 5, respectively.

Table 4. Existing species in megadiverse countries.

Nr.	Country	ESPECIES EXITENTES					
		Plants	Mammals	Birds	Reptiles	Amphibians	Fish
1	Australia *	15,638	282	751	755	196	183
2	USA *	18,956	428	768	261	194	790
3	Brazil **	56	524	1,622	468	517	3,000
4	Colombia **	51	456	1,815	520	583	1,500
5	China **	30	499	1,244	387	274	1,010
6	Ecuador **	21,1	271	1,559	374	402	44
7	Mexico **	30	450	1,05	717	284	468
8	Peru **	20	344	1,703	298	241	855
9	Malaysia **	15	286	738	268	158	600
10	South Africa **	23,42	247	774	299	95	153
11	Venezuela **	21,07	288	1,36	293	204	1,250
12	Papua New Guinea **	21	242	762	305	200	282
13	Philippines **	12	201	526	193	63	330
14	India ***	17	350	1,258	408	206	750
15	Indonesia ***	37	515	1,531	511	270	1,400
16	Madagascar ***	12	105	253	300	178	75
17	Republic of Congo 1 ***	11	415	1,094	268	80	962
	World	**250**	**4,629**	**9,04**	**6,458**	**4,222**	**18,91**

1 Includes Democratic Republic of the Congo and Republic of the Congo
* High income, ** Middle income, *** Low income

Table 5. Threatened and extinct species of megadiverse countries.

Nr.	Country	Threatened Species								Extint Species	
		Plants	Mammals	Birds	Reptiles	Amphibians	Fishes	Total Animals	TOTAL	Animals	Plants
1	Australia *	2,245	58	45	37	25	37	202	2,649	35	71
2	USA *	4,669	35	50	28	24	123	260	5,189	177	22
3	Brazil **	1358	71	103	15	5	12	206	1,77	4	5
4	Colombia **	712	35	64	15	0	5	119	950	3	3
5	China **	312	75	90	15	1	28	209	730	2	2
6	Ecuador **	824	28	53	12	0	1	94	1,012	4	4
7	Mexico **	1,593	64	36	18	3	86	207	2,007	22	11
8	Peru **	906	46	64	9	1	0	120	1,146	0	3
9	Malaysia **	490	42	34	14	0	14	104	698	0	3
10	South Africa **	2,215	33	16	19	9	27	104	2,423	10	53
11	Venezuela **	426	24	22	14	0	5	65	556	0	0
12	Papua New Guinea **	92	57	31	10	0	13	111	314	1	0
13	Philippines **	360	49	86	7	2	26	170	700	2	0
14	India ***	1,236	75	73	16	3	4	171	1,578	0	19
15	Indonesia ***	264	128	104	19	0	60	311	886	5	1
16	Madagascar ***	306	46	28	17	2	13	106	518	5	0
17	Republic of Congo 1 ***	3	10	3	2	0	0	15	33	0	0
	World	**3,375**	**1,096**	**1,107**	**253**	**124**	**734**	**3,314**	**40,378**	**641**	**380**

1 Includes Democratic Republic of the Congo and Republic of the Congo
* High income, ** Middle income, *** Low income

Conclusions

The megadiverse countries of the Democratic Republic of the Congo, Indonesia, Madagascar and India, located on the equatorial line, belong to the low income group. Their gross national products together represent just 10% of the USA equivalent. On the contrary, the population of these low income countries is four times greater than of the USA and Australia combined. Moreover, their population density is 8 times greater than that of the USA and Australia, which results in an enormous impact on their biodiversity and natural resources.

The low social development of megadiverse countries, excepting the USA and Australia, is the principal threat to their biodiversity, because in those countries, conservation occupies a secondary place after social problems. The developed countries are responsible for many of the environmental problems affecting global biodiversity, such as their carbon dioxide emissions and energy consumption would indicate. For this reason, biodiversity depletion has its origin in the current economic policies that support the neoliberal system, which in turn, support developed countries, making bigger the gap between the latter and the deveñoping countries.

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