

EDUCATION, INDUSTRY, TRADE AND DEVELOPMENT OF AFRICAN COUNTRIES IN 1980-99

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Abstract:

The paper presents a general view of the educational level of population and its relation to economic development in African countries. We present a comparative view of production by sector and per inhabitant, external trade, years of schooling and fertility rates, by country and by large areas, and we analyse the causes of poverty and economic stagnation of many countries. The conclusions point to the low value of average years of school as the main cause of economic problems in these countries, and to the need of fostering international co-operation in order to increase the educational level and effectively counteract poverty and guarantee a sustained economic development.

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1. Production by sector in African countries

In the following tables we present the evolution of African areas and countries for the purpose of comparison. The values of production by sector, and per inhabitant, correspond to real Gdp in Agriculture (pha), Industry (phi), Services (phs), and Total (pht). Agriculture includes also Fishery and Forestry, and Industry includes mining, energy, manufacturing and building activities. Values are measured in US dollars at 1999 prices and purchasing power parities (PPPs). This method generally gives rise to better international comparison for developing countries than exchange rates, which usually undervalue the figures for less developed countries.

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Nevertheless, the opposite can happen in some cases and figures based on PPPs can overvalue the production in some countries, particularly in the case of Agriculture. Data of production by sector and per inhabitant in 1980-99 has been developed by us, at constant prices and purchasing parities, from figures published by several international institutions such as World Bank, UN, The Economist and another sources. In some cases the figures are only provisional estimations because the lack of data of some countries has been based on some complementary information on the country and area.

The large areas are considered according to their geographical situation and size of population, and include at least one hundred million people in each area for the year 1999. The population of each area corresponds not only to the countries with more than one million inhabitants, listed in the next relation, but also to some territories like Western Sahara in Northern Africa and some small Oceanic Islands in Eastern Africa.

We have considered the following six areas:

1) Northern Africa, with Egypt as the most populated country, includes also Algeria, Libya, Mauritania, Morocco and Tunisia.

2) North Western Africa and Gulf of Guinea, with Nigeria as the principal country, includes also Benin, Côte d'Ivoire, Ghana, Guinea, Senegal, Sierra Leona and Togo.

3) Sahel and Central Africa, with Congo-Kinshasa, or ex-Zaire, as most populated country, includes also Burkina-Faso, Burundi, Cameroon, Central African Republic, Chad, Congo-Brazzaville, Mali, Niger and Rwanda.

4) North-Eastern Africa includes Eritrea, Ethiopia, Somalia and Sudan.

5) Eastern Africa includes Kenya, Madagascar, Tanzania and Uganda.

6) Southern Africa, with the Republic of South Africa as the main country, includes also Angola, Botswana, Lesotho, Malawi, Mozambique, Namibia, Zambia and Zimbabwe.

Tables 1 to 12 present data for production by sector in countries belonging to these areas, corresponding to the years 1980, 1990 and 1999. The figures are expressed in dollars per inhabitant at 1990 prices and purchasing power parities, PPPs.

In 1999 the average values of value-added per inhabitant in Agriculture, Industry, Services and total of Africa as a whole where, respectively: 422, 665, 987 and 2074 dollars at 1990 prices and PPPs.

In the same years the corresponding figures for World averages where much higher, with 591 dollars per head in Agriculture, 2285 in Industry, 4154 in Services, and a total value of Gdp per inhabitant of 7031 dollars at 1990 prices and PPPs.

So African values per inhabitant represent a 71% of world average in Agriculture, 29% in Industry, 24% in Services, and 29% in total Gdp per head, according to the comparison using PPPs, and they would be much lower if the comparisons were performed in terms of exchange rates.

Table 1. Ph in Agriculture and Total: Northern Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80a	ph90a	ph99a	Ph80t	Ph90t	Ph99t
Algeria	522	613	655	5537	5505	5040
Egypt	555	565	624	2304	3016	3673
Mauritania	361	347	415	1521	1504	1660
Morocco	460	680	605	2796	3285	3559
Tunisia	752	785	805	4443	4857	6190
Total Area 1	537	613	636	3251	3735	4102
Africa	430	416	422	2212	2123	2074
World	462	529	591	5434	6191	7031

Table 2. Ph in Industry and Services: Northern Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80i	ph90i	ph99i	ph80s	ph90s	ph99s
Algeria	3568	3350	2722	1447	1542	1663
Egypt	737	954	1212	1012	1497	1837
Mauritania	378	496	481	782	661	764
Morocco	936	972	1139	1400	1633	1815
Tunisia	1276	1372	1733	2415	2700	3652
Total Area 1	1423	1513	1565	1291	1609	1901
Africa	801	716	665	981	991	987
World	1732	1940	2285	3240	3721	4154

Northern area presents, for each sector, higher values than African averages, and total Gdp per inhabitant reached in 1999 a value of 4102 dollars almost double than African average of only 2074, although it represents only a 58% of world average.

In this area the highest value of phi corresponds to Algeria, followed by Tunisia, Egypt and Morocco. The highest increases of this variable and of real Gdp per head, in this group of countries during the period 1980-99, corresponds to Egypt and Tunisia.

Table 3. Ph in Agriculture and Total: North Western Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80a	ph90a	ph99a	Ph80t	Ph90t	Ph99t
Benin	248	301	372	889	838	980
Côte d'Ivoire	643	456	434	2176	1599	1808
Ghana	804	639	679	1680	1635	1887
Guinea	391	416	491	1703	1896	2133
Nigeria	349	357	359	1354	1126	1088
Senegal	295	289	265	1366	1379	1473
Sierra Leona	201	211	206	975	758	468
Togo	459	566	665	1828	1557	1547
Total Area 2	410	391	401	1448	1249	1273
Africa	430	416	422	2212	2123	2074
World	462	529	591	5434	6191	7031

Table 4. Ph in Industry and Services: North Western Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80i	ph90i	ph99i	ph80s	ph90s	ph99s
Benin	122	126	137	519	411	470
Côte d'Ivoire	302	320	434	1231	823	940
Ghana	395	393	472	481	603	736
Guinea	567	651	768	745	829	874
Nigeria	745	493	446	260	276	283
Senegal	273	309	368	798	781	840
Sierra Leona	282	258	112	492	289	150
Togo	398	318	325	971	673	557
Total Area 2	605	444	434	434	414	438
Africa	801	716	665	981	991	987
World	1732	1940	2285	3240	3721	4154

North Western Africa presents a high degree of poverty with a Gdp per inhabitant of only 1273 dollars in 1999, what means a 61% of African average, and only a 18% of world average. These data show even a decrease of industrial and total value-added of this area during the period 1980-90 and stagnation for the period 1990-99.

Table 5. Ph in Agriculture and Total: Sahel and Central Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80a	ph90a	ph99a	Ph80t	Ph90t	Ph99t
Burkina-Faso	277	292	326	795	904	1018
Burundi	447	452	309	850	946	583
Cameroon	583	547	683	1698	1728	1552
Central African R.	628	563	670	1386	1215	1219
Chad	296	294	343	726	963	902
Congo (Kinshasa)	644	582	578	3300	2688	996
Congo (Brazzaville)	80	83	76	847	910	758
Mali	341	368	366	742	767	796
Niger	377	314	319	1214	846	797
Rwanda	915	723	421	1430	1323	915
Total Area 3	526	485	481	1925	1721	997
Africa	430	416	422	2212	2123	2074
World	462	529	591	5434	6191	7031

Table 6. Ph in Industry and Services: Sahel and Central Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80i	ph90i	ph99i	ph80s	ph90s	ph99s
Burkina-Faso	211	238	275	307	374	417
Burundi	195	226	99	208	268	175
Cameroon	355	475	310	760	706	559
Central African R.	311	274	244	447	378	305
Chad	9	137	26	351	532	433
Congo (Kinshasa)	875	676	169	1781	1430	249
Congo (Brazzaville)	381	472	364	386	355	318
Mali	84	100	135	317	299	295
Niger	255	151	135	582	381	343
Rwanda	191	184	183	324	416	311
Total Area 3	464	413	190	935	823	326
Africa	801	716	665	981	991	987
World	1732	1940	2285	3240	3721	4154

Sahel and Central African countries are so poor as those of North Western area, and besides that they have experienced a negative evolution during the period 1980-99, with a Gdp per inhabitant of 1925 dollars in 1980 and only 997 in 1999.

Wars and conflicts, low level of education, excessive fertility rates and other factors explain the bad situation of these countries. They need an urgent plan from international cooperation in order to improve their educational level, reduce high fertility rates, increase production and reduce social conflict.

Table 7. Ph in Agriculture and Total: North-East Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80a	ph90a	ph99a	Ph80t	Ph90t	Ph99t
Eritrea	192	179	150	886	824	940
Ethiopia	419	320	321	658	554	655
Total Area 4	406	312	311	673	570	672
Africa	430	416	422	2212	2123	2074
World	462	529	591	5434	6191	7031

Table 8. Ph in Industry and Services: North-Eastern Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80i	ph90i	ph99i	ph80s	ph90s	ph99s
Eritrea	200	186	254	494	459	536
Ethiopia	42	34	46	197	200	288
Total Area 4	52	42	58	215	216	303
Africa	801	716	665	981	991	987
World	1732	1940	2285	3240	3721	4154

The available information for the other countries of this area, shows similar levels of poverty, with an estimation, for the year 1999, of per capita Gdp between 664 and 1084 dollars in the case of Sudan and between 575 and 1200 in Djibouti, according to several sources, as Maddison(2001) and Akal(2001).

It is very outstanding the low level of industrial production per inhabitant in this area, with an average in 1999 less than 10% of African average, being wars, natural disasters, low level of education and excessive fertility rates the main causes of the situation.

In the case of Sudan there are some figures that point to an improvement of industrial production during the last years of the 20th century. It would be desirable that it would also happen in all the area, as these countries need a higher degree of industrial Gdp per inhabitant for eradicating poverty.

Table 9. Ph in Agriculture and Total: Eastern Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80a	ph90a	ph99a	Ph80t	Ph90t	Ph99t
Kenya	320	305	278	984	1024	1030
Madagascar	287	280	248	1080	911	826
Tanzania	246	229	249	514	502	519
Uganda	517	499	525	880	891	1194
Total Area 5	335	316	317	823	805	865
Africa	430	416	422	2212	2123	2074
World	462	529	591	5434	6191	7031

Table 10. Ph in Industry and Services: Eastern Africa
(dollars per inhabitant at 1990 prices and PPPs)

Country	ph80i	ph90i	ph99i	ph80s	ph90s	ph99s
Kenia	182	184	175	482	535	577
Madagascar	151	126	116	642	505	462
Tanzania	72	73	73	196	200	197
Uganda	76	96	215	287	296	454
Total Area 5	118	120	141	370	369	407
Africa	801	716	665	981	991	987
World	1732	1940	2285	3240	3721	4154

Eastern Africa presents an average value of Gdp per inhabitant lower than African average, with only 865 dollars in 1999, what means only a 42% of African average. Uganda and Kenya are the countries of this group with highest values in that year.

This area also includes some more prosperous groups of islands, with per capita Gdp in 1999 higher than African average, as Mauricio with 9107 dollars, Reunion with 4800 and Seychelles with 7500. Comoros islands, with 1429 dollars per inhabitant present a value below African average but higher than Eastern Africa average.

The Southern area presents higher values of production per inhabitant in Industry and Services than African averages. The total Gdp per inhabitant reached in 1999 a value of 4614 dollars more than double the African average of only 2074, although it represents only a 66% of world average.

In the Southern area the highest values of pht correspond to Botswana, South Africa and Namibia, with important increases in the case of Botswana while Namibia and South Africa have shown a decrease in the real value of this variable for the period 1980-99 and a slight recovery afterwards.

Table 11. Ph in Agriculture and Total: Southern Africa
(dollars per inhabitant at 1990 prices and PPPs)

País	ph80a	ph90a	ph99a	Ph80t	Ph90t	Ph99t
Angola	351	266	157	2426	2547	2241
Botswana	352	344	282	3233	6051	7039
Lesotho	354	343	345	1336	1478	1918
Malawi	152	135	231	582	572	607
Mozambique	142	208	298	509	592	931
Namibia	682	572	678	6491	5052	5649
South Africa	385	373	368	9967	8657	9196
Zambia	255	257	140	1146	880	822
Zimbabwe	493	478	575	3085	2998	3027
Total Area 6	322	316	324	4958	4474	4614
Africa	430	416	422	2212	2123	2074
World	462	529	591	5434	6191	7031

Table 12. Ph in Industry and Services: Southern Africa
(dollars per inhabitant at 1990 prices and PPPs)

País	ph80i	ph90i	ph99i	ph80s	ph90s	ph99s
Angola	1032	1383	1569	1043	898	515
Botswana	1663	3104	3167	1218	2603	3590
Lesotho	398	500	729	584	635	844
Malawi	123	119	109	307	318	267
Mozambique	216	105	223	151	279	410
Namibia	2695	1763	1864	3114	2717	3107
South Africa	3862	3011	2943	5720	5273	5885
Zambia	509	390	214	382	233	468
Zimbabwe	1047	1024	757	1545	1496	1695
Total Area 6	1920	1602	1542	2716	2556	2748
Africa	801	716	665	981	991	987
World	1732	1940	2285	3240	3721	4154

As a summary of the analysis of production by sector in African countries we can see that production per inhabitant in Industry is generally very low, with values under 1000 US dollars per inhabitant in many cases, such as Mauritania in Northern Africa, Lesotho, Malawi, Mozambique, Zambia and Zimbabwe in Southern Africa, and all the countries in the case of the other areas: North-Western, Sahel and Central, North-Eastern, and Eastern.

The level of production by sector in Services maintains a high correlation with the level of production in Industry, and the real values of that variable, in the majority of African countries, are very low and therefore unable to guarantee adequate well-being for inhabitants.

It is of utmost importance that Africa improves its level of industrial production per inhabitant, as well as trade among African countries in order to guarantee sustained development.

Besides this the increase in population, due to low levels of education and very high averages in fertility rates, needs to be moderated, in order to get that the increases in total production lead to an increase in production per inhabitant. Education is the main factor to improve for reaching these goals. In the following section we analyse the data corresponding to population growth, educational level, public expenditure on education and fertility.

2. Education, fertility and development in African countries

In the tables below we show the values for population, in millions of people, for the years 1980, 1990 and 1999, in countries with more than one million inhabitants ordered by geographical areas. Totals per area also includes population of countries with less than one million inhabitants.

Other variables included in the tables are the following ones:

Tyr = Average total years of schooling of population over 15 years old, according to data from Barro and Lee(1999), and own estimations for missing data.

Eduh = Public Expenditure in education per inhabitant in 1995, estimated in Guisan(1997) and elaborated from UN sources.

Fer00 = Fertility rate in the year 2000, according to UN figures, representing the average number of expected children per woman.

Tables 13 to 18, show data corresponding to African countries, and we can see that the countries with a higher degree in the variables Tyr and Eduh have more moderate fertility rates than the others.

Countries with higher levels of education are generally also the best in general economic performance, with higher levels of industrial production per inhabitant and income per capita.

Table 13. Population, Education and Fertility. Northern Area

Country	pop80	pop90	pop99	eduh	tyr99	fer00
Algeria	18.7	25.0	30.5	384	4.7	3.2
Egypt	40.9	52.4	62.4	181	5.1	3.4
Mauritania	1.6	2.0	2.6	91	2.8	6.0
Morocco	19.4	25.1	28.2	200	4.6	3.4
Tunisia	6.4	8.1	9.5	293	4.2	2.3
Total Area 1	90.0	116.6	138.4	237	4.8	3.0
Africa	466.3	629.6	777.7	87	3.4	5.4
World	4429	5262	5970	258	5.8	2.8

Note: Data for Tyr99 in Morocco is a provisional estimation.

Source: Elaboration from Barro and Lee(1999), UN, World Bank and other international sources.

Table 14. Population, Education and Fertility. North Western Area

Country	pop80	pop90	pop99	eduh	tyr99	fer00
Benin	3.5	4.7	6.1	111	2.1	6.1
Côte d'Ivoire	8.2	11.9	14.7	90	3.5	5.1
Ghana	10.7	14.9	18.9	63	4.0	4.6
Guinea	4.5	5.7	7.2	40	2.6	6.3
Nigeria	71.1	96.2	123.9	7	2.7	5.9
Senegal	5.5	7.4	9.3	70	2.2	5.6
Sierra Leona	3.2	4.1	4.9	11	2.0	6.5
Togo	2.6	3.6	4.6	71	1.6	5.8
Total Area 2	112.8	153.2	195.5	29	2.8	5.7
Africa	466.3	629.6	777.7	87	3.4	5.4
World	4429	5262	5970	258	5.8	2.8

Table 15. Population, Education and Fertility. Sahel and Central Area

Country	pop80	pop90	pop99	eduh	tyr99	fer00
Burkina-Faso	7.0	9.0	11.0	12	2.0	6.9
Burundi	4.1	5.5	6.7	21	2.1	6.8
Cameroon	8.7	11.5	14.7	59	3.2	5.1
Central African R.	2.3	3.0	3.5	30	2.1	5.3
Chad	4.5	5.7	7.5	19	2.2	6.7
Congo (Kinshasa)	27.0	38.3	49.8	3	3.2	6.7
Congo (Brazzaville)	1.7	2.3	2.9	172	4.7	6.3
Mali	6.6	8.5	10.9	11	0.8	7.0
Niger	5.6	7.9	10.5	25	0.8	8.0
Rwanda	5.2	6.9	8.3	27	2.0	6.2
Total Area 3	73.7	100.3	127.6	21	2.5	6.6
Africa	466.3	629.6	777.7	87	3.4	5.4
World	4429	5262	5970	258	5.8	2.8

Table 16. Population, Education and Fertility. North Eastern Area

Country	pop80	pop90	pop99	eduh	tyr99	fer00
Eritrea	2.4	3.1	4.0	26	2.9	5.7
Ethiopia	37.7	50.4	62.8	26	2.1	6.7
Somalia	3.6	6.3	8.7	6	1.4	7.2
Sudan	18.0	23.7	28.8	68	1.9	5.5
Total Area 4	61.8	84.2	103.5	36	2.1	6.4
Africa	466.3	629.6	777.7	87	3.4	5.4
World	4429	5262	5970	258	5.8	2.8

Table 17. Population, Education and Fertility. Eastern Area

Country	pop80	pop90	pop99	eduh	tyr99	fer00
Kenya	16.6	24.2	30.0	90	4.0	4.6
Madagascar	8.9	11.7	15.1	10	2.6	6.1
Tanzania	18.6	26.0	32.9	31	3.0	5.5
Uganda	12.8	16.3	21.5	19	2.5	7.1
Total Area 5	58.7	80.4	101.9	44	3.1	5.7
Africa	466.3	629.6	777.7	87	3.4	5.4
World	4429	5262	5970	258	5.8	2.8

Table 18. Population, Education and Fertility. Southern Area

País	pop80	pop90	pop99	eduh	tyr99	fer00
Angola	7.0	9.7	12.4	33	2.0	7.2
Botswana	0.9	1.3	1.6	399	5.4	4.3
Lesotho	1.3	1.8	2.1	84	4.5	4.7
Malawi	6.2	8.5	10.8	20	2.6	6.7
Mozambique	12.1	15.7	17.3	34	1.1	6.3
Namibia	1.0	1.4	1.7	340	4.1	5.3
South Africa	27.6	37.9	42.1	272	7.9	3.1
Zambia	5.7	8.0	9.9	26	5.4	6.0
Zimbabwe	7.0	9.8	11.9	169	4.9	5.0
Total Area 6	69.3	94.9	110.8	152	4.9	5.0
Africa	466.3	629.6	777.7	87	3.4	5.4
World	4429	5262	5970	258	5.8	2.8

3. Exports of goods and services in African countries

In this section we present data corresponding to exports of goods and services in the years 1990 and 1998, expressed in US dollars per inhabitant, at prices and exchange rates for each year respectively.

Due to the moderate evolution of price indices in external trade of the USA, the figures for these two years, expressed in dollars, can be adequately compared.

We can realise that all African areas have a value of Exports per inhabitant clearly below world averages, according to the following estimations:

Exports of goods per inhabitant in 1998: 128 dollars African average and 917 World average.

Exports of services per inhabitant in 1998: 36 dollars African average and 224 dollars World average.

Exports of goods and services per inhabitant in 1998: 164 dollars African average and 1141 World average.

Tables 19 to 23 present data for countries and large areas, elaborated from World Bank statistics.

These data are expressed in dollars per inhabitant at current prices and exchange rates.

Table 19. Exports per head. Northern Area (dollars)

	1990			1998		
Country	Expgh	Expsh	Expth	Expgh	Expsh	Expth
Algeria	453	19	472	343	19	362
Egypt	49	92	141	51	127	178
Mauritania	238	7	245	178	9	187
Morocco	170	75	245	260	92	352
Tunisia	437	195	632	615	285	900
Total Area 1	197	78	275	205	104	309
Africa	143	29	172	128	36	164
World	657	154	810	917	224	1141

Table 20.Exports per head. North Western Area (dollars)

	1990			1998		
Country	Expgh	Expsh	Expth	Expgh	Expsh	Expth
Benin	61	23	84	70	17	87
Côte d'Ivoire	258	32	290	314	31	345
Ghana	61	5	66	91	9	100
Guinea	117	16	133	113	9	122
Nigeria	142	10	152	81	7	88
Senegal	103	48	151	107	36	143
Sierra Leona	33	11	44	2	10	12
Togo	74	31	105	51	31	82
Total Area 2	133	14	147	99	12	111
Africa	143	29	172	128	36	164
World	657	154	810	917	224	1141

Table 21. Exports per head. Sahel and Central Area (dollars)

	1990			1998		
Country	Expgh	Expsh	Expth	Expgh	Expsh	Expth
Burkina-Faso	17	4	21	29	4	33
Burundi	14	1	15	10	1	11
Cameroon	174	32	206	130	32	162
Central African R.	40	6	46	46	6	52
Chad	33	4	37	37	4	41
Congo (Kinshasa)	26	3	29	13	3	16
Congo (Brazzaville)	431	29	460	443	16	459
Mali	42	8	50	51	6	57
Niger	35	3	38	29	3	32
Rwanda	16	4	20	7	4	11
Total Area 3	53	8	61	44	7	51
Africa	143	29	172	128	36	164
World	657	154	810	917	224	1141

Table 22. Exports per head. Eastern Area (dollars)

	1990			1998		
Country	Expgh	Expsh	Expth	Expgh	Expsh	Expth
Ethiopia	9	5	14	9	6	15
Total Area 4	9	5	14	9	6	15
Africa	143	29	172	128	36	164
World	657	154	810	917	224	1141

Table 23. Exports per head. North Eastern Area (dollars)

	1990			1998		
Country	Expgh	Expsh	Expth	Expgh	Expsh	Expth
Kenya	43	32	75	67	21	88
Madagascar	27	11	38	16	18	34
Tanzania	16	5	21	21	17	38
Uganda	9	1	10	23	8	31
Total Area 5	24	14	38	35	16	51
Africa	143	29	172	128	36	164
World	657	154	810	917	224	1141

Table 24. Exports per head. Southern Area (dollars)

	1990			1998		
Country	Expbh	Expsh	Expth	Expbh	Expsh	Expth
Angola	402	7	409	238	19	257
Botswana	1401	144	1545	1245	154	1399
Lesotho	33	19	52	93	22	115
Malawi	49	4	53	50	4	54
Mozambique	8	7	15	12	17	29
Namibia	754	74	828	880	190	1069
South Africa	620	91	711	629	122	751
Zambia	163	12	174	76	12	87
Zimbabwe	176	26	202	179	26	205
Total Area 6	360	46	406	336	62	398
Africa	143	29	172	128	36	164
World	657	154	810	917	224	1141

We see that the majority of countries have very low levels of exports of both kinds, goods and services, which is due to low level of industrial production and to low development in tourism.

The highest levels of exports of goods per inhabitant correspond to Botswana, with 1245 dollars in 1998, Namibia with 880, South Africa with 629 and Tunisia with 615.

Some countries like Tunisia, and some particular small areas of Eastern Africa, like the French territories of Mauricio and Reunion Islands, show good performance in tourism, but they are for the moment rather exceptional in African areas.

There is usually a lot of interest in improving external trade from Africa to developed countries, but the main trade that many African countries should develop is with their neighbours, as to say trade among countries belonging to the same large area or next areas, which has proved to be fruitful in other parts of the world.

With very few exceptions, related with high level of exports of raw materials, the increase of trade depends heavily on industrial

development as both variables are closely related, so it is clear that African countries need to improve their industrial production in order to achieve higher standards of development.

The reason for an interest in increasing exports of goods and services is that it allows an increase in the import of many things, from raw materials to machinery, which are scarce in the country and highly necessary for improving increases in production per inhabitant in one or several sectors.

Several international econometrics models, as those presented in Cancelo, Guisan and Frias(2001) and those presented and cited in Neira and Guisan(2002), show that the educational level of population is also important for increasing industrial production and investment per inhabitant, and thus the main challenge for the future of African countries is to rise the number of average years of schooling of population.

Besides that, education is the main factor in achieving the aim of eradication of poverty, as it has a very significant influence in reducing excessive average rates of fertility, as shown in the international cross-country models estimated by Guisan, Aguayo and Exposito(2001).

While many areas of Latin America and Asia have lowered down the excessive fertility rates during the last decades of 20th century, this reduction has been very light in the case of the majority of African countries, because their low levels of education.

4. Final Comments and Conclusions

In this article we have analysed the situation of economic development in Africa in comparison with world averages of many variables such as value-added by sector in Agriculture, Industry and Services, educational level, expenditure on education, fertility rates and external trade.

We have analysed the situation in large areas and countries and we have found that, although there has been some progress in a few countries, the general situation is the economic stagnation, low level of education, low level of industrial development and low figures for external trade.

We have argued that all these variables are closely related with the level of education, and that good economic policies for African countries imply in all the cases to rise expenditure in education.

The main policy recommendation we make to more advanced OECD countries is that they should provide more support to Africa, because the economic stagnation of the majority of its countries is a source of poverty, unhappiness and distress in many ways.

Direct international investments and aids to development are generally welcome but unfortunately very low in comparison to what is needed.

In Guisan and Exposito(2001) we recommended to improve European Union cooperation with African development, together with other industrialized countries, mainly related with educational and industrial development. According to that study 200 billion dollars per year would be needed as public expenditure on education in Africa, for reaching an average per inhabitant similar to world average, but for the moment African countries can only afford 1/3 of this amount.

This means that international aids should collaborate with 2/3 of the total amount, around 133 billion dollars, what is much higher than the amount of 16 billion dollars that OECD(2001) report as the Official Development Aid received by African countries in 1999.

An improvement in education is the most urgent change needed, not only to avoid the problem of illiteracy but also to

improve quality of primary and secondary education, knowledge of the main international languages, quality educational television and other important initiatives that could be carried out with the help not only of governments but also of internal and foreign volunteers belonging to non-government organisations, who could help not only with direct help but also with indirect activities by promoting the analysis of this important challenges in television, newspapers and universities and other institutions in order to foster international cooperation.

As Collier and Gunning(1999) pointed out African economic performance has been markedly worse than that of other regions, with per capita GDP declined in some areas during the 1980s and 1990s, and with an average for African countries below the average for all low-income developing countries.

These authors analyse the results of some aggregate econometric models and also microeconomic studies trying to explain this evolution, and although they show some concern with the capacity of aggregate research to account for the main causes of poverty in Africa, they declare that, “to a surprising extent, the aggregate and microeconomic analysis cohere”. They analyse problems arising from geographical factors, macroeconomic policies and microeconomic policies, and concede a great importance to democratisation for paving the way to politically sustainable reforms.

Fosu(2000) analyses the importance of export for African development and concludes that “the beneficial effects of exports are confirmed for African economics, though available evidence suggests that it is the manufacturing component that really matters for growth”. This conclusion is very similar to our own conclusion regarding the positive effect of industry for development and the important relations between external trade and industrialization.

An interesting international study with conclusions similar to ours about the great importance of human capital on development is the study by Ramirez, Ranis and Stewart(1997). They analyse two-way chains that can generate self-reinforcing, virtuous or vicious

cycles of development, and found that although both human capital and economic growth should be jointly promoted, human capital should be given sequential priority, as it is the main guarantee for sustainable development.

The data that we have analysed show that the efforts for improving education and economic development have been higher in the Northern and Southern areas, and that the problem of poverty in the majority of Western, Central and Eastern African countries is the low level of education, which implies a low level of industry and production per inhabitant, and many difficulties for improving socio-economic organization and achieving the goal of poverty eradication.

As a final conclusion we would like to insist on the necessity of improving European and international cooperation with Africa in order to reach the 133 billion of dollars yearly needed to guarantee an African average of education expenditure per inhabitant near world average. For that purpose European Union needs to have better channels for European civil society initiatives, and for improving politicians dialogue with researchers and society.

With higher levels of education, African countries will increase the rate of growth of real production and a diminution of average rate of population growth, and as a consequence of both circumstances they will increase the level of production per inhabitant, eradicating poverty in the same way that other world areas have got during the 20th century.

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¹ Documents available at <http://ideas.repec.org>

² Information at <http://www.usc.es/economet/aaa.htm>