

**INDUSTRY, EDUCATION, DEVELOPMENT AND QUALITY OF LIFE IN  
AFRICAN COUNTRIES, 1995-2020**

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**Abstract**

We analyze economic development of 53 African countries for a period of 25 years, 1995-2020, classified by geographical areas accordingly to UN classification: Northern, Western, Central, Eastern and Southern or Austral. We compare the averages rates of growth of real Gross Domestic Product (GDP), Population and real GDP per inhabitant (PH) of Africa and the World for the periods 1900-1999 and 1995-2019. We highlight the great importance of Education and Industry on Economic and Social Development, having into account Population evolution (Fertility rates) and several indicators of Quality of Life (Happiness, Quality of Government and Peace, as well as other indicators related with Poverty diminution and increase of Health care and Life Expectancy). We estimate an econometric model of intersectoral relationships showing the positive effect that Industrial production per inhabitant, together with other activities, has on the development of Services. For the period 1995-2020, several African countries have experienced a positive evolution, but progress has been too much slow in some of the poorest countries, mainly due to low levels of average years of Schooling. We include some suggestions for international cooperation.

Keywords: Education, Industry, Development, Fertility Rates, Quality of Life, Africa

JEL Codes: I1, I2, I3, J13, L7, L8, O55

**1. Introduction.**

In section 2 we present some references to economic literature related with economic development in Africa, with a focus on the contribution of Industry and Schooling to Production per capita and Well-being.

In section 3, we present a summary of the evolution for the period 1995-2020 in 53 African countries, highlighting the positive impact of education and industry in the increase of production per inhabitant and the usual positive effects on quality of life. We include an econometric model for 37 countries that shows the positive impact of industry on non industrial sectors, including some dummy variables to have into account some positive effects of tourism.

In section 4 we show the evolution of each country by UN geographical areas, outstanding progress in the indicators in many countries as well as the need to improve international cooperation to development, particularly in countries with low levels of quality of life and great difficulties to improve it.

In section 5, we present the main conclusions. Finally, we include an Annex with supplementary information.

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## 2. Review of the literature

In previous studies we have analyzed the positive effects of education on economic development and health care in African countries. In the Annex we include a reference to our research on economic development of Africa, related with the following topics:

- 1) Education, Health and Life Expectancy: Guisan and Exposito(2005), (2006), (2007a) and (2016).
- 2) Poverty: Guisan and Exposito(2010) and (2016), and Aka and Guisan(2017).
- 3) Investment and Production Function: Guisan and Neira(2006) and Guisan (2014).
- 4) Female participation: Guisan(2009) and Guisan and Exposito(2010)
- 5) Development, Population and Production by Sector. Guisan and Exposito(2001), (2002), (2007b) and (2020), Guisan, Aguayo and Exposito (2001a,b), Guisan(2006). (2007), (2008) and (2017).

In Guisan(2021) we comment on several econometric models of 163 countries and estimate several relationships to show the important impact of Education on Development and the positive effect that the increase of real income per capita usually has on Happiness and Quality of Life.

Regarding studies by other authors, we would like to highlight the interesting contributions by Clifton(2017), Helliwell et al (2019), through the World Happiness Reports, and other authors to the elaboration and analysis of important indicators, like Barro and Lee with their contribution to the statistics of Education, the contributions of Kaufman and coauthors to the indicators of Quality of Government, and to the Institute the Index of Global Peace, related with conflict and violence in society.

Deaton(2008) related Income, Health and Well-being around de World with data from the Gallup World Poll.

UNECA(2018) present a Report on the transition from the Millennium Development Goals (MDGs) to Agenda 2063 for sustainable development in Africa. Education and Industry are highlighted in order to foster development. By the year 2012 the continent as a whole had not met the MDG target of halving extreme poverty by 2015: in 1990 280 million Africans were classified as extremely poor, but by 2012 this number had risen to 389 million on account of the failure of income growth to keep pace with rising population growth. The Report highlight the increase of primary education, and decline in child mortality during the period 1990-2015. Three countries (Cabo Verde, Rwanda and Libya) have already achieved the target of reducing the maternal mortality ratio by three quarters between 1990 and 2015 while 15 countries have reduced MMR by more than 50 per cent.. North Africa was one of the few regions that met the sanitation target. Access to sanitation facilities in Africa excluding North Africa increased only modestly, from 24 per cent in 1990 to 30 per cent in 2015. As a result, in line with the global trend Africa will not meet the sanitation target of 66 per cent coverage The number of mobile-cellular subscriptions has grown exponentially and now 80 per cent of the African population use a mobile phone. On the other hand, 84 per cent of African people are not currently linked to a global network of content and application, while more than half of the world's population are connected to

the Internet. In particular, high cost remains the main barrier to improved internet use in Africa.

Asongu and Nwachukwu(2016) examine interconnections between law, politics and quality of government in Africa, with data of 38 African countries for the period 1994-2020. They present a summary of the average values and standard deviations of the World Bank WGI indicators, based on Kaufman research, and found that usually there is a positive impact of economic development on the degree of democracy.

Zekarias(2016) analyzes the impact of Foreign Direct Investment (FDI) on economic growth of Eastern Africa,

Gnimassour and Anyanwu(2018), analyze the effect of remittances, by African emigrants from abroad, on economic development.

Tausch(2018) develop new comparable indices of global value development from the latest ser of World Values Survey, including the following points: : 1. The non-violent and law-abiding society 2. Democracy movement 3. Climate of personal non-violence 4. Trust in institutions 5. Happiness, good health 6. No redistributive religious fundamentalism 7. Accepting the market 8. Feminism 9. Involvement in politics 10. Optimism and engagement 11. No welfare mentality, acceptancy of the Calvinist work ethics. The article suggests a mixture of feelings: pessimistic tendencies for some countries, although certain recent optimism, corresponding to economic and human rights data reflected in the Index of the Development of Civil Society, finding that there is at least some hope for Africa, on this front.

Marandu, Mburu and Amanze(2019) analyze the trends in Foreign Direct Investment (FDI) to Africa with data from UNCTAD for years 1990-2016. Their findings show that, although Africa is in dire need for FDI due to scarcity of capital, it is not able to attract as much FDI compared to advanced countries and other developing regions. Most FDI is concentrated on Southern Africa followed by Northern Africa. The FDI that comes into the continent is further concentrated in the primary (extractive) sector. The benefits to the region have not been as significant as in East Asia where FDI was mainly into the secondary (manufacturing) sector.

Bittencourt(2019) presents an interesting study to test the contribution of Education to the moderation of high fertility rates and to increase of real income per capita. The sample correspond to 15 Subsaharan countries for the period 1980-2009: Angola, Botswana, Congo DR, Lesotho, Madagascar, Mozambique, Mauricio, Malawi, Namibia, South Africa, Swazilandia (Eswatini), Seychelles, Tanzania, Zambia y Zimbabwe.

Zajackowski and Kumar(2020) explores India-EU cooperation with Africa to address the challenges faced by many countries, having into account its challenges and threats, and outlines specific areas of cooperation including defense, security, development, trade, investment, infrastructures, climate changes and strengthening of democracy.

Glitsch et al (2020) indicate that Germany FDI in Africa is lagging behind, China, France, the Netherlands, the UK, the US and other economies, representin only 1% of German total FDI stock abroad in year 2018. German FDI is more concentrated on

manufacturing. The German Federal Government support proactive policies to encourage FDI, for example by offering investment guarantees to German firms to cover political risks, Recipient countries have also developed tools to attract FDI including "Investment Promotion Agencies" (IPAs) and "Special Economic Zones" (SEZs), aiming at compensating for weaknesses in the national business environment.

Nyasha, Odhiambo and Asongu(2020). Analyze direct and indirect effects of Tourism on Economic Growth in Sub-Saharan Africa.

### **3. Economic Development in African Countries: A summary for 1995-2020**

#### **3.1. Definition of variables and sources of data**

We have analyzed the correlations between the following variables:

PH = Production per capita, in Dollars at constant prices and Purchasing Power Parities (PPPs). Source: Elaborated from WB(2021) WDI.

TYR = Total Years of Schooling attainment, average of adult population (25 years and older). Source: WB(2021) WDI and own estimations based on other sources in case of data unavailability.

FER = Fertility rates, number of average children expected per woman in her life. Source: Elaborated from WB(2021) WDI.

XMEAN = Combined indicator of Quality of Life, calculated as the average of three positive indicators, in decimal scale, as  $XMEAN = (X1 + X2 + X4) / 3$ . Data taken from Guisan(2021 b). The worst situation is when the index is close to zero and the best one it is higher than 5 and close to 10.

X1 is an Index of Happiness (sources Clifton(2017), WHR(2021), and some provisional estimations in a few cases)

X2 is an Index of Quality of Government in decimal scale. Source, calculated by Guisan(2021), by transforming data of the Index IQGVoice."Voice and Accountability", from WB(2021) WGI (published in the scale -2.5 to 2.5 where 0 represents World average), to an scale 0 to 10:  $X2 = 5 + 2 \times IQGVoice$ .

X4 is an Index of Peace, or lack of Conflicts (including many types of violence, as explained in the Annex), calculated by Guisan(2021) by transforming data of the Index GPI published by IEP(2021), the Institute of Economics and Peace of the University of Sydney. The GPI Index has a scale 0 to 4 measuring "Conflict" where a peaceful country has a value close to 0 (lack of Conflict) and a country with high levels of Conflict have a value close to 4. X4 Index is a positive measure for "Peace", with a minimum value close to 0 for the worst situations (countries with GPI close 4) and a maximum value of 10 for the best situations (countries with GPI close to 0):  $X4 = 2.5(4 - GPI)$  or  $X4 = 10 - X3$ , where X3 is the Index of Conflict, in scale 0 to 10, calculated as  $X3 = 2.5 \times GPI$ .

QHi (for  $i=A,I,S$ ) is the real value of production by sector, in Dollars at constant prices, calculated by authors from the percentages of sectoral value-added published by WB(2021) WDI. A is Agriculture (includes Agriculture, Fishery and Forestry), I is Industry (includes Manufacturing Energy and Building) and S is Services.

### 3.2. Evolution of Development and Quality of Life for the period 1995-2020

Table 1 presents a comparison of African average and World average of the variables PH95, PH19, X1, X2, X4, and the real value per capita of production by sector in Agriculture (QHA), Industry (QHI, including Industry and Building) and Services (QHS).

Table 2 presents a comparison of average rates of annual growth of real Gross Domestic Product (GDP), Population (Pop) and Production per inhabitant (PH) in Africa and the World for the 20th century and the period 1995-2019. Rates are exponential in percentage.

Table 1. Development, Education, Indicators of Quality of Life and Industry in Africa  
(Data for the period 1995-2019, PH in Dollars at 2017 prices and PPPs)

	PH 95	PH 19	Tyr 10	Fer 95	Fer 19	X1	X2	X4	QHA	QHI	QHS
Africa	3849	6086	4.78	5.51	4.10	4.28	3.50	4.37	592	1211	2411
World	9886	16135	8.09	2.86	2.40	5.35	5.00	4.80	766	4771	12149

Source: Elaborated from WB(2021) for PH, Tyr and Fer; from Clifton(2017) and WHR(2019) for X1, from WB(2021) WGI for X2 and from IEP(2021) for X4. Indexes X1,X2,X4 in decimal scale, with 0 the worst situation and 10 the best one. Data of PH95, PH19 in constant Dollars per inhabitant at 2017 prices and PPPs. Data of QHA, QHI and QHS from table A2 in the Annex.

PH increased by 58% in Africa and by 63% in the World, for the period 1995-2019. This important increase has contributed to diminution of poverty, increase of health care expenditure and life expectation and thus it has had positive impacts on Quality of Life.

Table 2. Rates of growth of trsl Gross Domestic Product (GDP), Population (Pop) and Production per capita (PH),

	Period 1900-1999			Period 1995-2019		
	Rate GDP	Rate Pop	Rate PH	Rate GDP	Rate Pop	Rate PH
Africa	3.12	2.12	1.0	4.64	2.71	1.93
World	2.97	1.40	1.56	3.30	1.24	2.06

Source: Elaborated Guisan, Aguayo and Exposito(2001), for the period 1900-1999, and by Guisan and Exposito(2021). Note: Exponential rates calculated from World Bank WDI statistics.

The average real Production per inhabitant (PH) of African countries evolved from 3849 Dollars (at 2000 prices and PPPS) in year 1995 to and 6086 in year 2019. The average rate of growth per year, for the period 1995-2019, was 1.93%. World average of real value of PH evolved from 9886 in year 1995, to 16135 in year 2019, what implies a rate of growth per year of 2.06%.

Regarding the evolution of indicators of Quality of Life, WB(2021) WGI provides information for several years of the indicator Quality of Government-Voice, but the comparison through time are limited to the relative position of a country regarding World average, and this source does not allow to compare the evolution of World average through time. The indicator of Conflict by IEP(2021) also indicates relative position of a country regarding World average, but the value of World average does not change through time.

Table 3 shows 53 African countries classified by the value of the average rate, per year, of growth of PH for the period 1995-2019.

Table 3. African countries classified by the average rate of growth of Production per head for the period 1995-2019

Rate	Countries
NA	Djibouti, Eritrea, Liberia, Sao Tome & Principe, Somalia
<0	Burundi, Central African R, Congo R, Gabon, Guinea Bissau, Zimbabwe
0-1	Chad, Comoros, Congo DR, Gambia, Libya, Madagascar, Mauritania, Niger
1-2	Algeria, Benin, Cameroon, Cote d'Ivoire, Guinea, Kenya, Malawi, Mali, Namibia, Senegal, Sierra Leone, South Africa, Togo
2-3	Angola, Botswana, Burkina Faso, Egypt, Eswatini, Lesotho, Morocco, Nigeria, Seychelles, Tunisia, Uganda, Zambia
3-4	Ghana, Mauritius, Sudan, Tanzania
>4	Cabo Verde, Equatorial Guinea, Ethiopia, Rwanda

Source: Elaborated by authros, from WB(2021) WDI statistics. Note: NA=Not available.

The Indicator of Happiness (X1) and the Indicator of "Percentage of people Thriving", based on the approach of the pioneering social researchers Dr. Hadley Cantril, allow to know if the World average increases through time.

United Nations and he World Happiness Reports (WHR) allows to analyze the evolution through time of the indicator of Happiness (X1) for some countries for the period 2006-2019, and shorter periods for other countries.

Helliwell et al(2019) present the evolution of X1, from the average of years 2005-2008 to the average of years 2016-2018. The averages, weighted for population, at World level, experienced a slight decrease (from around 5.4 to around 5.2), while in Sub-Sahara Africa the average experience a slight increase (from around 4.3 to 4.6). The authors present a list of countries by descending order of increase.

They include 17 African countries with an increase in this indicator: Benin, Togo, Congo R, Sierra Leone, Cameroon, Burkina Faso, Niger, Nigeria, Mali, Kenya, Mauritania, Chad, Zimbabwe, Burundi, Ghana, Senegal, Liberia.

They also include 12 African countries with a diminution of this indicator : Uganda, Mozambique, Namibia, Madagascar, Zambia, South Africa, Egypt, Rwanda, Malawi, Tanzania, Central African R and Botswana.

Those authors also present data of indicators of recent positive and negative experiences.

Clifton(2021) analyzes the evolution of emotions, through indicators of positive and negative experiences of recent daily life. He finds that the indicator of positive experiences has increased, for the period 2006-2020, at World level, from 68% o 71%, and that the indicator of negative experiences has also increased, for the same period, from 14% in year 2006 to 31% in year 2019 and 32% in year 2020.

Morales and McGeeney(2012) Present data of the indicator of "percentage of people thriving" for more than 140 countries in year 2011. They found a clear relationships

between that indicator and the levels of income per capita, with an average of 24% in the World while in low income countries the average is only 14% and it the average is as high as 45% in high-income countries.

Table 4 includes several groups of African countries accordingly to the percentage of people thriving in year 2011. See the Annex and Gallup(2009) in relation with the Cantril's Index.

Table 4. A group of 36 African countries, classified by "Percentage of People Thriving"

%Thriving	Countries
5 or lower	Benin, Botswana, Burundi, Central African R, Comoros, Guinea, Madagascar, Senegal,
5-10	Congo DR, Egypt, Gabon, Kenya, Niger, Rwanda, Sudan, Tanzania
10-15	Burkina Faso, Cameroon, Congo R, Djibouti, Malawi, Mali, Sierra Leone, Tunisia, Zambia, Zimbabwe,
15-20	Algeria, Eswatini (Swaziland), Mauritania, Mauritius, Uganda
20-25	Lesotho, Mozambique, Nigeria
25-30	Ghana
30-35	Angola

Source: Elaborated by authors from the Gallup list, published by Morales and McGeenry (2012)

Clifton(2017) present an interesting analysis of several countries for the period 2006-2016, regarding the indicator "percentage of people thriving", which is and indicator very expressive of a good social environment. That indicators varies from values lower than 5% (for very unhappy countries) to percentages between 50 % and 75% for the happiest countries of the World.

Tables in this section show that there has been some advancements in Africa for the period 1995-2020, but that many countries have yet very low levels of quality of life.

### 3.2. Correlations and causality relationships between the variables.

As seen in Guisan, Aguayo and Exposito (2001), usually the increase of average year of Schooling of adult population has a positive effect on economic development. Besides economic development usually favors an increase of Happiness and the average Index of Quality of life, as seen in Guisan(2021) and other studies.

Out of 53 African countries, we may notice that: 1) only 8 have a value of Happiness Indicator (X1) close to or higher than World average (5 or higher). 2) only 7 countries have an Indicator of Quality of Government (X2) close or higher than World average (4.9 or higher), 3) there are 25 countries with Peace Indicator close or higher than World average (4.7 or higher). Poverty and lack of personal opportunities seem to be the mean cause of unhappiness.

Regarding the degree of economic development, among the 53 countries we find: 1) only 11 had in year 1995 an average Production per head (PH) close or higher than World average (8900 Dollars or more). 2) In year 2019 only 7 African countries had an average Production per head close or higher than World average of that year (14000 or more). 3) In

year 2019, there were 12 countries with real production per head close or higher than World average of year 2010, but 41 countries were below and many of them had scarcely advanced for the period 2000-2019.

Table 5 presents the correlation coefficient between seven variables of table 1.

Table 5. Correlations between the seven variables in 53 African countries

	PH19	PH10	TYR10	FER19	X1	X2	X4
PH19	1.0000	0.8943	0.7459	-0.6536	0.6164	0.4626	0.2401
PH10	0.8943	1.0000	0.6057	-0.4926	0.5539	0.1852	0.1383
TYR10	0.7459	0.6057	1.0000	-0.7111	0.4115	0.4042	0.2404
FER19	-0.6536	-0.4926	-0.7111	1.0000	-0.5457	-0.5313	-0.2946
X1	0.6164	0.5539	0.4115	-0.5457	1.0000	0.4328	0.1753
X2	0.4626	0.1852	0.4042	-0.5313	0.4328	1.0000	0.5873
X4	0.2401	0.1383	0.2404	-0.2946	0.1753	0.5873	1.0000

Source: Calculated by Guisan and Exposito, from table 1.

PH19 show a high positive correlation with its past value (ph10) with the level of Education in the past decade (represented by Tyr10), and with the indicators of Quality of Life, and it is negatively related with the evolution of Fertility rate (represented by Fer19).

TYR10 is positively related with the variables of Economic Development (Ph19 and Ph10) and also with indicator X1 and X2.

FER19 is negatively correlated with each of the other variables of table 6, mainly with the Educational level of the past decade (represented by Tyr10).

X1 shows its maximum positive correlation with PH19.

X2 show its maximum positive correlation with X4 (Peace) and Development (PH19).

X4 has a correlation coefficient higher than 0.40 only with X2. It seems that there are positive relationships, unilateral and/or bilateral, between components of X4 and X2. In Guisan(2021) we find more evidence in favor of the direction of causality from X2 to X4.

As seen in Guisan, Aguayo and Exposito(2001), and in other studies, Education is usually one of the main sources of economic development, because help to increase the difference between the rate of growth of production and the rate of growth of population. Besides it has other positive effects on productivity per worker and real wages, and an important impact on poverty diminution and increase of health care and life expectancy.

Besides the international sample of 163 countries, in Guisan(2021) we have estimated several equations with this sample of 53 African countries around year 2019 or 2020, and 110 countries from other geographical areas, that are important to highlight the great positive impact of Education on other variables related with economic development and with quality of life. The effects of changes sometimes is very quick impacts and in other cases they evolve slowly through time. That study includes the following equations:

- 1) The indicator of Quality of Life XMEAN related with Production per head PH
- 2) Increase of PH related with increase of Schooling



3) Moderation of high Fertility rates related with the increase of Schooling, what, implies a moderation in the rate of Population growth, and for a given rate of growth of Production (GDP) implies an increase of Production per head (PH).

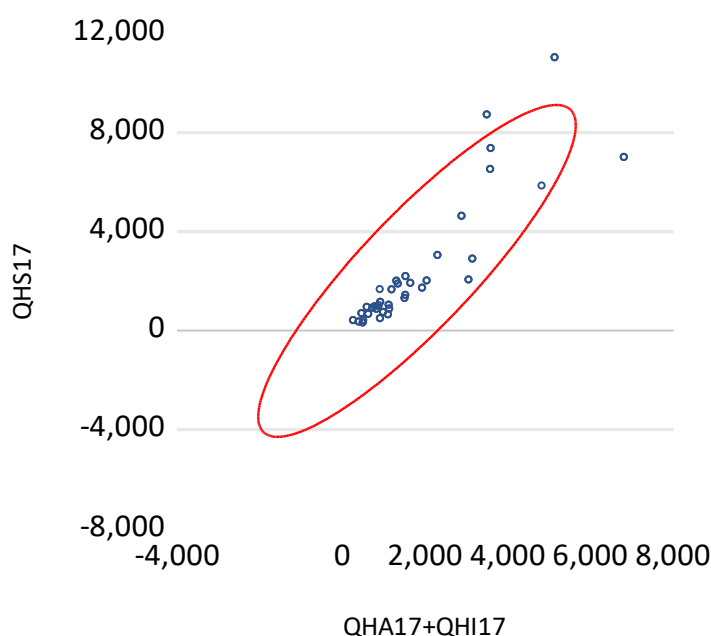
4) Positive effects of PH and X2 on X1.

5) Positive effect of Schooling, PH and X4 on X2.

### 3.3. Industry and Non industrial sectors

Table A1 in the Annex shows data of production by Sector in Agriculture, Industry and Services in 37 African countries in year 2017. From those data we have elaborated graph 1, tables 6 of correlations and table 8 with an estimated equation relating QHS with QHA+QHI.

Graphs 1. Production in Services related with the sum of Agriculture and Industry



Source: Elaborated from WB(2021) WDI data included in table A1 in the Annex. Notes: Production per capita in year 2017, expressed in Dollars at 2011 Prices and PPPs, in Agriculture (QHA), Industry (QHI) and Services (QHS).

There is a high correlation coefficient, of 0.8787, between QHS with the sum QHA+QHI, and even higher between QHS and QHI (0.91).

Table 6. Correlation coefficients of QHS with QHA and QHI, year 2017

	QHA17	QHI17	QHS17
QHA17	1.00	0.40	0.32
QHI17	0.40	1.00	0.91
QHS17	0.32	0.91	1.00

Source: Elaborated by authors from data of 37 African countries of table A2 in the Annex

Besides Industry and Agriculture, other factors, like Tourism, also have great impact on QHS but usually the most important is QHI. The higher the value of QHI the higher the value of QHS and real Production per head (PH). In order to increase QHI, the educational level of population has several positive impacts.

Table 7, present the estimation of the relationship between Production per head in Services (QHS), as a function of the sum of Production per head in Agriculture, Forestry and Fishing (QHA) and Industry (QHI). The sample includes data for 37 African countries in year 2017, of table A2 in the Annex, that we have elaborated from WB(2021) WDI.

Table 7. QHS as a function of (QHA+QHI) and dummy variables for special cases

Dependent Variable: QHS17. Method: Least Squares. Sample 37 countries				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
QHA17+QHI17	1.348370	0.071154	18.94999	0.0000
D1	-2196.231	881.6969	-2.490914	0.0181
D4	4083.637	822.1026	4.967308	0.0000
D11	-2078.315	767.5789	-2.707624	0.0108
D33	3995.705	777.0797	5.141950	0.0000
R-squared	0.929922	Mean dependent var		2411.135
Adjusted R-squared	0.921162	S.D. dependent var		2621.595
S.E. of regression	736.0926	Akaike info criterion		16.16568
Sum squared resid	17338632	Schwarz criterion		16.38337
Log likelihood	-294.0650	Hannan-Quinn criter.		16.24242
Durbin-Watson stat	1.944133			

All the coefficients are positive and statistically significant, with values of t-Statistic higher than 2. The dummy variables take a value equal to 1 in special cases (D1 in Algeria, D4 in Botswana, D11 in Congo R. and D33 South Africa) and zero in other countries.

Countries with positive significant coefficient of its dummy variable have a development of Services higher than expected accordingly to the production of Agriculture and Industry, what may be due to higher levels of Tourism or other services, and countries with negative coefficient for some reason seem to have a lower development of services.

The main directions of causality in our empirical studies are: 1) Education (Tyr) decreases Fertility rate (Fer) and increases industrial, non industrial and total production per head (QHI, QHNI) and  $PH=QHI+QHNI$  2) PH usually diminishes poverty, increases health care and increases X1, X2, X4 and XMED. 4) QHI increases QHNI Education expenditure per capita and TYR.

Regarding the positive effect of economic development on quality of life, there are some exceptions, like it seems to be the case of Botswana that we comment in the Annex, where the increase of PH did not lead to the expected increase in Happiness indicator (X1) what may be due to problems of income distribution, poverty, lack of enough health care expenditure, or other ones.

As seen in tables 2 and A2, in the Annex, the non-weighted mean of production by sector and per inhabitant of 37 African countries is low in comparison with World average, of 132 countries, particularly in Industry and Services. While in Agriculture the average of

African countries was, at 2011 prices and PPPs, rather close to World average (592 in Africa and 766 at World level). The distance in Industrial development was higher (1211 in Africa and 4771 the World average, and there was even more distance in Services (2411 in Africa and 12149 the World Average). Total production per head was only 4214 in that set of African countries and 17686 in the World.

#### 4. Evolution of countries, by geographical areas of the UN classification, 1995-2019

To increase PH it is necessary a Gross Domestic rate of growth higher than the rate of population growth, and thus moderation of excessive fertility rates is required to increase real GDP per capita. Many African countries had experienced difficulties to eradicate poverty and to increase development, due to low levels of schooling, because societies with low educational level have usually excessively high fertility rates.

At World level there was an increase of the annual value of production per capita since 1995 to year 2019, of around 6249 Dollars, at constant prices of year 2017.

This important increase has been favored by the increase of the average years of schooling (Tyr) and the diminution of the average Fertility rates. For the moment we cannot compare the improvements for that period in the indicators of quality of life because these indicators focused to measure if a country has relative positions higher or lower than World average of each year, but some important indicators for Happiness as Life Expectation and health care expenditure per inhabitant, have experienced an important increase as seen in the Annex. In the sections 4.1 to 4.5 we summarize relevant information for the 5 areas of Africa, accordingly to UN classification. See map in the Annex.

##### 4.1, Northern Africa

This area has only one country, Libya, close to the World average of Production per inhabitant. Due to conflicts and war this country has experienced a decline both in PH (for the period 2010-2019 as seen in Table 1) and in the indicator of Quality of Government.

Table 4.1. Economic Development and Quality of Life in Northern Africa

country	PH 1995	PH 2019	Dif*	Tyr 1995	Tyr 2010	Fer 1995	Fer 2019	X1	X2	X4
Algeria	7935	11511	3576	4.17	5.98	3.45	2.99	5.87	3.94	4.22
Egypt AR	6483	11763	5280	4.05	6.55	3.84	3.28	4.73	3.90	4.00
Libya	15026	15174	148	4.69	7.31	3.64	2.21	5.52	0.98	2.08
Morocco	3821	7537	3716	2.66	4.24	3.30	2.38	5.23	4.94	4.98
Sudan	1805	4186	2381	1.97	3.13	5.83	4.35	4.14	2.02	2.65
Tunisia	5931	10755	4824	4.13	6.58	2.61	2.17	4.80	4.60	4.73

Source: See footnote of table 4.0. Note: Dif\* is the difference between PH in years 2019 and 1995, as to say the real increase of Production per inhabitant in 24 years.

*Production per head in year 2019:* The best position corresponds to Libya, with 15174, in spite of the diminution of the period 2010-2019, followed by Egypt with 11763, Algeria with 11511 and Tunisia with 10755. The highest increases of the period 1995-2020, in table 4.1, corresponds to Egypt and Tunisia. In comparison with World Average in year 2019 (16135) we notice that all the countries of table 1 were below. Libya was clearly over World

average in year 2010 (as shown in table 1), but unfortunately due to war conflict, the country suffered an important diminution for the period 2010-2019

*Schooling in year 2019.* There was an increase of average years of Schooling of 25+ population (TYR) from In year 1995 to year 2020. All the countries of table 1 were below World average in 1995 (6.65) and 2010 (8.56). The highest levels in year 2010 correspond to Libya and Tunisia

*Fertility rate in 2019:* The World average was 2.86 in year 1995 and 2.40 in year 2019. Tunisia has a moderate level of Fertility, below World average in both years. In year 2020 also Libya and Morocco got moderation, below World average. Other countries of the table have Fertility rates rather high in comparison with World average.

*Indicators of Quality of Life.* The highest value of X1 (>5) correspond to Algeria, Lybia and Morocco, while the highest levels of X2 and X4 correspond to Morocco and Tunisia.

### 3.2. Western Africa

All the countries of this area have a value of PH in year 2019 lower than World average, being Cabo Verde the country with the highest value of this group in year 2019 and the highest increase for the period 1995-2019.

Table 4.2. Economic Development and Quality of Life in Western Africa

Country	PH 1995	PH 2019	Dif*	Tyr 1995	Tyr 2010	Fer 1995	Fer 2019	X1	X2	X4
Benin	2253	3287	1034	2.15	3.30	6.36	4.77	3.66	4.48	4.78
Burkina Faso	1076	2178	1102	2.04	3.06	6.84	5.11	4.03	3.66	3.68
Cabo Verde	2546	7172	4626	-	4.80	4.51	2.24	5.50	5.50	5.75
Cote d'Ivoire	4065	5213	1148	2.50	4.22	6.23	4.59	4.18	4.04	4.70
Gambia, The	2128	2223	95	1.80	2.82	6.00	5.15	5.05	3.66	5.38
Ghana	2515	5411	2896	5.66	6.76	5.17	3.82	4.12	4.70	5.73
Guinea	1595	2567	972	2.45	3.94	6.39	4.63	3.51	3.22	4.83
Guinea-Bissau	2088	1939	-149	-	2.90	6.29	4.40	3.50	2.14	4.73
Liberia	-	1428	8	3.10	4.09	6.16	4.25	3.53	2.18	5.00
Mali	1458	2322	864	0.88	1.50	7.06	5.79	4.19	2.70	2.97
Mauritania	4769	5197	428	2.61	3.77	5.61	4.50	4.29	3.46	4.28
Niger	1012	1225	213	0.88	1.45	7.73	6.82	4.03	3.76	3.53
Nigeria	2902	5135	2233	2.56	4.21	6.26	5.32	5.07	2.94	3.23
Senegal	2380	3361	981	2.06	2.40	5.95	4.56	4.53	5.02	5.35
Sierra Leone	1111	1720	609	1.96	3.06	6.61	4.17	4.71	2.96	5.47
Togo	1207	1599	392	3.53	4.33	5.70	4.26	3.49	3.62	4.40

Source: See footnote of table 4.0. Note: Dif\* is the difference between PH in years 2019 and 1995, as to say the real increase of Production per inhabitant in 24 years. Liberia sin dato de 1995. In countries without data for 1995, the increase was calculated as the difference between data of years 2019 and 2010.

*Production per capita:* The highest levels of PH in year 2019 correspond to Cabo Verde (7172). Ghana (5411), Cote d'Ivoire (5313), Mauritania (5197) and Nigeria (5135),

although all of them below World average. The highest increases of PH for the period 1995-2019 are those of Cabo Verde, Ghana and Nigeria.

*Schooling* has increased in countries of table 2 for the period 1995-2010, although the value of TYR in year 2010 is yet low in comparison with World Average. The highest values of this indicator are those of Ghana, Cabo Verde, Cote d'Ivoire, Nigeria and Togo.

*Fertility rates* were very high in year 1995 with values higher than 6 in 10 countries of table 2. These rates have experienced some diminutions and in year 2020 but they are over the World average. The most moderate values correspond to Cabo Verde and Ghana.

*Quality of Life*: Happiness indicator takes a value higher than 5 in Cabo Verde, and Nigeria. Regarding the Indicator of Quality of Government the highest levels correspond to Cabo Verde and Senegal. The low levels of Production per capita in many countries of this area implies persistence of poverty, low budgets for health care, education expenses and other social services, and thus contribute to low levels of Happiness.

### 4.3. Central Africa

Among countries of table 4.3, only Equatorial Guinea has experienced a high increase of real Production per capita for the period 1995-2019. This has helped to improve public infrastructures, education expenditure and other services to population. Gabon had a level of Production higher than World average both in years 1995 and 2019.

Table 4.3. Economic Development and Quality of Life in Central Africa.

	PH 1995	PH 2019	Dif*	Tyr 1995	Tyr 2010	Fer 1995	Fer 2019	X1	X2	X4
Angola	4140	6670	2530	1.93	<3	6.92	5.44	3.79	2.64	4.95
Cameroon	2531	3642	1111	4.15	5.96	5.98	4.51	4.69	3.24	3.25
Central Afri. R.	1099	945	-154	2.43	3.57	5.62	4.64	2.69	1.62	2.18
Chad	941	1580	639	2.25	3.18	7.43	5.65	3.94	2.08	3.77
Congo DR	1040	1098	58	2.92	3.61	6.78	5.82	4.28	1.62	2.0
Congo R	4548	3872	-676	5.06	5.67	4.93	4.37	4.29	2.14	4.28
Eq. Guinea	1781	18503	16722	-	5.5	5.97	4.43	5.00	2.06	5.22
Gabon	18515	14950	-3565	5.22	7.57	5.02	3.92	4.46	3.18	4.83
Sao Tome & P.	-	4005	648	-	>5	5.19	4.27	4.00	3.72	5.75

Source: See footnote of table 4.0. Note: Dif\* is the difference between PH in years 2019 and 1995, as to say the real increase of Production per inhabitant in 24 years. Note: Data of Tyr10 for Angola was not available and we include its value in year 2005.

*Production per head in year 2019* is very low in some of the countries of this area, as Central African Republic, Chad and Congo DR. Only two countries are close to World average: Equatorial Guinea with 18503, thanks to oil production, and Gabon with 14415 mainly thanks also to oil production and other extractive industries.

*Schooling and Fertility rates*: In this area there has been an increase of schooling and diminution in very high fertility rates. The highest value of TYR in 2010 corresponds to Gabon, with 7.57, close to the World average (8.09) and the other countries are very much below. Fertility rates in year 2019 are very high in comparison with World average.

*Quality of Life:* X1 and X2 are below World average. The highest level of the index of Happiness (X1) correspond to Equatorial Guinea, thanks to several improvements in infrastructures and public services (schooling, sanitation, health care, etc.) favored by the high increase of public budget as effect of the oil production. The value of X4 (Index of Peace and not violence) is very low in some countries, indicating very bad conditions for development and quality of life.

This area needs international cooperation for Peace, Schooling and Production, as well as their positive effects on poverty diminution and increase of opportunities of a better life for many citizens.

The economic perspectives that appear in WB(2001): Global Economic Perspectives for 2021-2023, for the Low-Income countries Group, include rates between 0.7 and 4.1 in the case of Central African Republic, 1 and 2.9 in the case of Chad, and between 2.5 and 4.1 for Congo D.R. These rates would imply a positive effect but not enough advance, and for that reason it will be very helpful domestic and foreign cooperation for development.

#### 4.4. Eastern Africa

Table 4.4. present low values of development, years of schooling, and indicators of quality of life, in countries of Eastern Africa.

Table 4.4. Economic Development and Quality of Life in Eastern Africa.

Country	PH 1995	PH 2019	Dif*	Tyr 1995	Tyr 2010	Fer 1995	Fer 2019	X1	X2	X4
Burundi	948	752	-196	1.58	2.69	7.19	5.32	2.90	2.48	3.93
Comoros	2751	3059	308	2.41	5.62	5.84	4.14	4.61	3.48	5.75
Djibouti	-	5535	4192	-	4.63	5.35	2.68	5.00	3.64	3.63
Eritrea	-	-	-	2.76	3.69	5.97	4.00	2.90	1.76	3.63
Ethiopia	677	2221	1544	2.02	3.54	6.99	4.15	4.46	3.90	3.48
Kenya	2968	4330	1362	4.54	6.19	5.46	3.42	4.55	4.30	4.38
Madagascar	1569	1619	50	2.49	4.31	5.98	4.03	3.64	2.80	5.10
Malawi	743	1086	343	2.71	4.29	6.31	4.13	3.97	3.42	5.22
Mauritius	9567	22870	13303	6.26	8.19	2.14	1.40	5.63	6.74	5.00
Mozambique	469	1282	813	0.80	1.40	5.97	4.78	4.55	3.56	4.70
Rwanda	746	2228	1482	1.97	3.48	6.17	3.99	3.47	5.68	4.93
Seychelles	15488	27521	12033	-	10.0	2.41	2.34	5.60	6.02	5.75
Somalia	-	309	-	-	3.06	7.65	5.98	2.90	0.82	1.98
Tanzania	1294	2660	1366	4.09	5.12	5.88	4.83	3.35	3.46	5.28
Uganda	1083	2187	1104	3.38	5.42	7.02	4.82	4.08	3.84	4.45
Zambia	1909	3470	1561	6.04	6.6	6.19	4.56	4.51	3.46	5.10
Zimbabwe	3227	2800	-427	5.54	7.25	4.09	3.53	3.87	2.50	3.77

Source: See footnote of table 4.0. Note: Dif\* is the real increase of Production per inhabitant in 24 years. Note: In the Annex we comment on some particular data: 1) Data of Happiness Index for Somalia that was revised because it seemed overvalued. 2) Data for Government quality in Comoros was revised, with a second source, because it seemed undervalued in the first evaluation.

*Production per inhabitant:* Only Seychelles and Mauritius show a high level of PH19, over World average, and an important increase of production per inhabitant for the period 1995-2019 higher than 10000 Dollars at constant prices. Djibouti has experienced an

increase higher than 4000 Dollars per inhabitant, but below World average, while several poor countries did not experience any advance and even, in some cases, have suffered a decrease. They need international economic policies of support to development.

*Schooling and Fertility rates:* The highest levels of Tyr10 correspond to Mauritius and Seychelles. The lowest Fertility rates (Fer19), below 3, correspond to Djibouti, Mauritius and Seychelles. Is very important to foster education in order to favor the difference between the rate of growth of Production and the rate of growth of Population, to diminish poverty and increase quality of life.

*Quality of Life:* Only Djibouti, Mauritius and Seychelles had in year 2019 a value of X1 (Happiness Index) close or higher than World average, while several countries had values below 3 (Burundi, Eritrea and Somalia). Only Mauritius, Rwanda and Seychelles had in year 2019 a value of X2 (Quality of Government) higher than World average, while several countries had values below 3 (Burundi, Eritrea, Madagascar, Somalia and Zimbabwe). The highest values of X4 (Peace) in year 2019 (5 or over) correspond to Comoros, Madagascar, Mauritius, Seychelles, Tanzania and Zambia.

#### 4.5. Southern Africa or Austral Africa

Table 4.5 show values of economic development higher or close to World average and higher than African average in 4 out of 5 countries.

Table 4.5. Economic Development and Quality of Life in Southern Africa.

Country	PH 1995	PH 2019	Dif*	Tyr 1995	Tyr 2010	Fer 1995	Fer 2019	X1	X2	X4
Botswana	9935	17777	7842	6.71	8.87	3.77	2.84	3.77	5.52	5.63
Eswatini	5259	8622	3363	4.24	4.02	4.43	2.96	4.87	3.46	3.63
Lesotho	1622	2695	1073	5.13	5.63	4.19	3.11	3.81	3.18	4.50
Namibia	6237	9728	3491	5.67	6.22	4.57	3.34	4.57	5.10	5.18
South Africa	9541	12482	2941	8.22	9.43	3.14	2.38	4.83	5.60	4.15

Source: See footnote of table 4.0. Note: Dif\* is the real increase of Production per inhabitant in 24 years. Note: In the Annex we include comments about Botswana, a country that presents a value of X1 very low in comparison with other indicators of development. Several sources show that it is not due to undervaluation of this variable but to special circumstances related with poverty.

*Production per capita:* Increased in the 5 countries of table 4.5, with the lowest increase in case of Lesotho.

*Schooling and Fertility:* Tyr increased in the 5 countries for the period 1995-2010, and Fertility diminish to values below 3.5 but yet higher than World average.

*Quality of Life:* The highest values of X1 (Happiness), higher than 4.5, correspond to Eswatini, South Africa and Namibia, while the highest values of X2 (Quality of Government), higher than 5, correspond to Botswana, Namibia and South Africa, and the highest values of X4 (Peace), higher than 5, to Botswana and Namibia.

*The case of Botswana:* The highest value of PH, both in 1995 and 2019, and the highest increase for the period of 24 years, correspond to Botswana, as well as the highest level of Schooling and the most moderate Fertility rates. It is surprising that his country presents a lower value of X1 than expected, having into account that the country has values higher

than 5 in X2 and X4. It does not seem to be a case of underestimation but a particular problem of this country with some failures related with poverty, income distribution, availability of some social services that explain the low value of the Happiness Index. In the Annex we include some links related with unhappiness in Botswana.

## 5. Conclusions

In spite of some advancement for the period 1995-2020, many African countries need to foster international cooperation to development. Increasing education, moderating excessive high fertility rates, increasing investment per capita, particularly in Industry, in order to foster development of Services and real income per capita. Besides those are some of the most important factors that may help as well as measures addressed to increase quality of Government and diminution of conflicts and violence.

We have estimated an econometric model that show the positive impact of Industrial production per capita on production of Services per capita. Some degree of industrialization is usually very necessary to increase development, diminish poverty and increase health care and Happiness. Only 2 African countries, out of 37 of table A2, show a value of Industrial production per capita higher than World average.

The educational level needs to be increased in many countries in order to favor a moderation of excessive values of Fertility rates and to reach a higher increase of the difference between the rate of Production and the rate Population growth

In table 2 we may notice that the rates of growth of real Gross Domestic Product in Africa, have been higher than World Average, but the high rates of Population Growth in many African countries (mainly due to low levels of Schooling), explains that the rate of growth of Production per inhabitant (PH) has been lower in Africa than World average, both in the 25 years of the period 1995-2020 and across the 20th century. The increase of Education contributes to moderate the rate of Population growth and to increase the rate of growth of Production per capita.

African countries with, at the same time, indicator of Schooling close to 6, or higher, and Fertility rate below 3 children per women in table 1 are the 8: Algeria, Cabo Verde, Djibouti, Libya, Mauritius, Seychelles, South Africa and Tunisia.

Morocco got a value of Fer19 below 3 but the indicator Tyr10, based on WB(2021) was below 6 in year 2010 although it has increased in the following years with a value around 5.65 in year 2019. Besides there are 4 countries close of higher than 6 for Tyr10 but with Fer19 yet higher than 3: Egypt, Kenya, Morocco and Namibia.

Indicators of Happiness, as X1 and the interesting Indicators of Gallup related with percentages of people Thriving, Fighting and Suffering are interesting not only to know the relative position of a country during a period, but also to see the evolution through time. Some indicators of quality of life, like X2 or X4, are interesting to see the relative position of a country in comparison with World average, but they are not helpful to analyze improvements of absolute level through time, because World average is always constant (with a value 5 in the decimal scale).



Indicator X1 as well as other indicators like Life Expectancy, show a positive evolution of many African countries for the period 1995-2020, mainly due to the increases of Schooling, moderation of Population Growth and increase of real Production per capita. There are some particular cases, like the case of Botswana, with an indicator X1 below expected accordingly to the evolution of Production per head, as explained in the Annex.

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## Annexes

### Annex 1. Economic Development of Africa for the period 1995-2020

Table A1 present the evolution of real Production per head, in Dollars at 2017 prices and Purchasing Power Parities (PPPs), for the years 1995, 2010, 2019 and 2020. We may notice a general diminution in year 2020 in comparison with 2019 due to the special circumstances of the economic effects of the pandemic of Covid19.

We have chosen to compare the period 1995-2019 instead of 1995-2020 because year 2019 is not affected by the special circumstances of the pandemic. The inclusion of the value of PH of year 2010 allow us to notice the different evolution for the subperiods 1995-2010 and 2010-2019.

Table A1. Economic Development 1995-2020 (Production per inhabitant, in constant Dollars at 2017 prices and Purchasing Power Parities (PPPs))

N	Country	PH 1995	PH 2010	PH 2019	PH 2020	%Increase 24 years	Average Per year
1	Algeria	7935	10971	11511	10682	45.07	1.56
2	Angola	4140	7692	6670	6198	61.11	2.01
3	Benin	2253	2705	3287	3323	45.89	1.59
4	Botswana	9935	14126	17777	16040	78.93	2.45
5	Burkina Faso	1076	1716	2178	2161	102.42	2.98
6	Burundi	948	846	752	731	-20.68	-0.96
7	Cabo Verde	2546	6200	7172	6045	181.70	4.41
8	Cameroon	2531	3086	3642	3576	43.90	1.53
9	Cent.Af.R.	1099	1201	945	928	-14.01	-0.63
10	Chad	941	1733	1580	1520	67.91	2.18
11	Comoros	2751	2878	3059		11.20	0.44
12	Congo DR	1040	866	1098	1072	5.58	0.23
13	Congo R	4548	5212	3872	3476	-14.86	-0.67

14	Cote d'Ivoire	4065	3661	5213	5174	28.24	1.04
15	Djibouti	-	1343	5535	-	-	-
16	Egypt AR	6483	10340	11763	11951	81.44	2.51
17	Eq. Guinea	1781	34732	18503	-	938.91	10.24
18	Eritrea	-	700	700	-	-	-
19	Eswatini	5259	7459	8622	8393	63.95	2.08
20	Ethiopia	677	1259	2221	2297	228.06	5.07
21	Gabon	18515	14415	14950	14400	-19.25	-0.89
22	Gambia, The	2128	2347	2223	2159	4.46	0.18
23	Ghana	2515	3739	5411	5319	115.15	3.24
24	Guinea	1595	1871	2567	2671	60.94	2.00
25	Guinea-Bissau	2088	1747	1939	1847	-7.14	-0.31
26	Kenya	2968	3330	4330	4220	45.89	1.59
27	Lesotho	1622	2448	2695	2378	66.15	2.14
28	Liberia	-	1420	1428		-	-
29	Libya	15026	22540	15174	10282	0.98	0.04
30	Madagascar	1569	1553	1619	1510	3.19	0.13
31	Malawi	743	969	1086	1066	46.16	1.59
32	Mali	1458	2083	2322	2217	59.26	1.96
33	Mauritania	4769	4757	5197	4983	8.97	0.36
34	Mauritius	9567	16798	22870	19470	139.05	3.70
35	Morocco	3821	6281	7537	6916	97.25	2.87
36	Mozambique	469	1027	1282	1229	173.35	4.28
37	Namibia	6237	8924	9728	8788	55.97	1.87
38	Niger	1012	1037	1225	1199	21.05	0.80
39	Nigeria	2902	4932	5135	4917	76.95	2.41
40	Rwanda	746	1507	2228	2099	198.66	4.66
41	Sao Tome+P	-	33.57	4005			
42	Senegal	2380	2797	3361	3300		
43	Seychelles	15488	20893	27521		77.69	2.42
44	Sierra Leone	1111	1414	1720	1648	54.82	1.84
45	Somalia	-	309	309	-		
46	South Africa	9541	12452	12482	11466	30.82	1.13
47	Sudan	1805		4186		131.91	3.57
48	Tanzania	1294	2007	2660	2635	105.56	3.05
49	Togo	1207	1225	1599	1589	32.48	1.18
50	Tunisia	5931	10113	10755	9727	81.34	2.51
51	Uganda	1083	1861	2187	2178	101.94	2.97
52	Zambia	1909	3126	3470	3270	81.77	2.52
53	Zimbabwe	3227	2273	2800	2538	-13.23	-0.59

Source: WB(2021) WDI and own calculation of columns (5) and (6)

**Annex 2. Sectoral Production per capita in year 2017 and Population for 2000-2017.**Table A2. Production by sector in year 2017 and Population in 2000-2017: 38 African countries.  
(Production per inhabitant in year 2017, Dollars at 2011 prices and Purchasing Parities)

Order	Country	QHA Agri	QHI Industry	QHS Services	PH Total	Pop 2000	Pop 2017
1	Algeria	1651	5170	7001	13822	30463	41389
2	Angola	606	2549	2890	6045	13841	29817
3	Benin	476	446	1147	2069	7197	11175
4	Botswana	322	4823	11021	16165	1754	2205
5	Burkina Faso	481	351	865	1697	11292	19193
6	Burundi	191	74	406	671	6486	10827
7	C.Afri.R.	245	155	347	746	3777	4596
8	Cameroon	476	838	1999	3313	14856	24566
9	Chad	853	257	645	1754	8216	15017
10	Congo DR	159	341	308	808	50052	81399
11	Congo R	327	2731	2045	5103	3438	5111
12	Cote d'Ivoire	769	880	1915	3565	16735	24437
13	Egypt AR	1226	3602	5845	10673	67285	96443
14	Ethiopia	583	407	735	1724	64298	106000
15	Ghana	798	1247	2006	4051	19867	29121
16	Guinea	442	682	1030	2154	8434	12068
17	Kenya	1031	499	1431	2961	30689	50221
18	Lesotho	174	1021	1652	2847	1788	2091
19	Madagascar	405	332	912	1648	16195	25571
20	Malawi	301	166	687	1154	11512	17670
21	Mali	774	366	879	2019	11647	18512
22	Mauritania	873	1065	1719	3657	2645	4283
23	Morocco	928	1964	4617	7509	27838	35581
24	Moambique	323	310	657	1289	17911	28649
25	Namibia	702	2881	6510	10093	1894	2403
26	Niger	365	146	410	921	11782	21602
27	Nigeria	1116	1194	3042	5351	117608	191000
28	Rwanda	585	299	1006	1889	8025	11981
29	Senegal	518	832	1882	3232	10343	15419
30	Sierra Leone	846	72	485	1404	4509	7488
31	South Africa	288	3212	8715	12215	44000	57000
32	Tanania	807	705	1297	2809	34763	54664
33	Togo	363	236	939	1538	5364	7698
34	Tunisia	1061	2535	7354	10950	9564	11433
35	Uganda	435	360	974	1768	24309	41162
36	Zambia	150	1387	2181	3718	10702	16854
37	Zimbabwe	248	662	1658	2568	12595	14237
	<b>Africa 37</b>	592	1211	2411	4214	743674	1148853
	<b>World</b>	766	4771	12149	17686	5863730	7234726

Note: Elaborated by Guisan and Exposito, from WB(2021) WDI statistics.

**Annex 3. Life Expectancy, Development and Schooling in Africa 1980-2014**

Table A3: Life Expectancy (Lex), Production per head and Education (Ty), 1980-2014

		Lex 1980	Lex 2014	Dif. 1980- 2014	Gdp Per head	Tyr 80	Tyr 00	Tyr 10
1	Algeria	58.2	74.8	16.6	7564	1.74	5.50	7.04
2	Benin	47.2	59.5	12.3	1424	0.65	2.55	3.26
3	Botswana	60.5	64.4	3.9	12462	2.29	7.62	8.90
4	Burundi	47.3	56.7	9.4	366	1.09	1.83	2.69
5	Cameroon	51.2	55.5	4.3	2058	2.11	4.78	5.91
6	Central African R	48.9	50.7	1.8	708	1.02	2.84	3.54
7	Congo, DR	46.3	58.7	12.4	311	1.16	3.17	3.47
8	Congo, R	56.1	62.3	6.2	3808	2.45	5.55	5.88
9	Cote d'Ivoire	50.7	51.6	0.9	1704	1.32	2.75	3.31
10	Egypt, A.R.	58.3	71.1	12.8	5544	2.05	4.66	6.40
11	Ghana	52.3	61.3	9.0	1475	3.45	6.11	7.09
12	Kenya	57.8	61.6	3.8	1481	2.69	5.93	6.95
13	Lesotho	53.7	49.7	-4.0	1437	3.72	4.91	5.78
14	Malawi	44.7	62.7	18.0	791	1.75	3.04	4.24
15	Mali	39.6	58.0	18.4	955	0.37	1.02	1.38
16	Mauritania	54.2	63.0	8.8	2203	1.78	2.94	3.73
27	Morocco	57.5	74.0	16.5	4227	1.24	3.37	4.37
18	Moambique	41.9	55.0	13.1	845	0.73	0.89	1.20
29	Namibia	57.7	64.7	7.0	5808	4.23	6.58	7.36
30	Niger	39.4	61.5	22.1	653	0.46	1.09	1.44
21	Rwanda	48.0	64.0	16.0	1044	1.14	2.26	3.34
22	Senegal	48.9	66.4	17.5	1736	2.39	3.65	4.45
23	Sierra Leone	40.7	50.9	10.2	742	0.98	2.23	2.88
24	South Africa	57.0	57.2	0.2	9477	4.79	7.23	8.21
25	Tanzania	50.5	64.9	14.4	1286	2.54	4.57	5.11
26	Togo	52.3	59.7	7.4	895	1.72	4.37	5.27
27	Tunisia	62.0	74.1	12.1	8566	2.02	4.84	6.48
28	Uganda	49.2	58.5	9.3	1141	1.87	3.86	4.72
29	Zambia	51.5	60.0	8.5	1401	3.31	5.89	6.54
30	Zimbabwe	59.4	57.5	-1.9	500	3.23	5.89	7.25

Source : Elaborated by Guisan and Expostio(2016) from World Bank(2016), for Life Expectancy and Gross Domestic Product per head, and from Barro and Lee(2010) for Tyr (Total years of Schooling, average year per adult, for population +25 years age). GDP per head in year 2010, expressed in Dollars of 2005 according to Purchasing Power Parities.

**Annex 4. Poverty in Africa**

Table A4. Poverty count in 24 African countries and People below 2 \$ of income per day, 2000-2005 and below 5.50 for the period 2011-2015.

	<b>% 2000</b>	<b>% 2005</b>	<b>% 2011- 2015</b>	<b>Pop 2005</b>	<b>Gdph 2005</b>	<b>Million People below 2 \$ in 2005</b>
Algeria	15.10	..	29.2	32.854	6361	5.0
Benin	..	73.40	90.6	8.439	1000	6.2
Botswana			60.4			
Burkina Faso	76.39	71.77	92.3	13.228	1093	9.8
Burundi	87.60	..	96.8	7.548	584	6.6
Cameroon	54.32	..	68.9	16.322	1978	8.9
Cote d'Ivoire	49.62	48.83	82.3	18.154	1401	8.9
Egypt, A.R.	43.89	..	61.9	74.033	3985	32.5
Ethiopia	77.80	..	90.2	71.256	896	55.4
Ghana	78.5	..	56.9	22.113	2149	17.4
Kenya	58.34	..	86.5	34.256	1042	20.0
Lesotho	56.10	..	..	1.795	2472	1.0
Madagascar	87.66	85.10	97.3	18.606	802	16.1
Malawi	62.94	62.94	96.7	12.884	597	8.1
Mali	72.00	..	..	13.518	930	9.7
Mauritania	63.08	..	58.8	3.069	1993	1.9
Morocco	14.33	..	31.3	30.168	3954	4.3
Mozambique	76.26	74.14	91.8	19.792	1220	14.9
Nigeria	92.83	92.38	..	131.53	1058	121.8
Rwanda	87.77	..	..	9.038	1193	7.9
Senegal	56.17	..	..	11.658	1615	6.5
South Africa	34.07	..	57.1	45.192	11044	15.4
Tanzania	89.93	..	93.1	38.329	653	34.5
Tunisia	6.64	..	18.3	10.022	7423	0.7
Zambia	91.09	87.19	87.2	11.668	930	10.4
Total 24 countries	..	..	..	655.4	2598	423.9

Source. Elaborated by Guisan and Exposito(2006) and updated by Guisan and Exposito(2021), from WB statistics.



## Annex 6. UN geographical areas of Africa



## Annex 7. Some supplementary information

The case of Botswana

International Monetary Fund (2017): [Botswana: Technical Assistance Report-Public Investment Management Assessment](#)

Global Peace Index: several indicators of conflict.

<https://datosmacro.expansion.com/demografia/indice-paz-global>

Cabo Verde: <https://www.bbc.com/news/world-africa-13148486>

Dice que Cabo Verde es el segundo país de Africa en libertad de prensa

<https://www.bbc.com/mundo/noticias-internacional-41652407>

World happiness Report WHR <https://www.bbc.com/pidgin/world-56456277>

<https://es.statista.com/estadisticas/965337/ranking-de-los-paises-mas-felices-de-africa/>

<https://www.theglobaleconomy.com/Somalia/happiness/>

<https://www.theglobaleconomy.com/economies/>

<https://www.theglobaleconomy.com/Eritrea/>

<http://hdr.undp.org/en/countries/profiles/SYC>

Global data tiene datos de todos los países por zonas rurales y urbanas: Comores, Djibouti, Somalia.

Seychelles de Internet

<https://globaldatalab.org/areadata/edyr20/SOM/>

<https://globaldatalab.org/areadata/maps/edyr20/>

Eswatini <https://www.theglobaleconomy.com/Swaziland/happiness/>

Comoros

[https://www.theglobaleconomy.com/Comoros/wb\\_voice\\_accountability/](https://www.theglobaleconomy.com/Comoros/wb_voice_accountability/)

Regional and Sectoral Economic Studies: <https://www.usc.gal/economet/rses.htm>