

**FOOD, AGRICULTURE, PRODUCTION, POPULATION AND POVERTY IN  
THE WORLD, 2000-2017: PRIORITIES FOR SUSTAINABLE  
DEVELOPMENT**

GUISAN, Maria-Carmen

EXPOSITO, Pilar

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**Abstract**

Poverty eradication and increase of quality of life in poorest countries is recognized as an international objective but we need improve policies because, in spite of some remarkable advances, there are yet many problems (hunger, lack of sanitation and safe water, and other ones related with low levels of production per head, low levels of average years of schooling and poverty) affecting to hundreds million people in Less Development Countries (LDCs). Among the different options usually considered for international cooperation, we think that it is important to choose a mix of measures that contributes to achieve development in LDCs and, at the same time, to increase quality of life and diminish total environmental pollution at World level. The question is not only to support the aim of reaching sustainable development but also to say when and how good measures should be reinforced. In this study we analyze the relationship between low levels of production per capita and poverty all over the World, and point to some priority measures to foster sustainable development and eradicate poverty thorough education, sustainable production and international cooperation.

JEL Codes: I3, N5, O1, O4, O5, O57, Q1, Q18,

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**1. Introduction**

In this study we try to focus not only in the main goals of international cooperation for a better World, but also in the main priorities that should guide the policies to get it. While there is great consensus on the main goals, it seems that there is lower consensus on the choice of economic policies to get it. We may contribute with recommendations based on our experience of several decades devoted to Economics research on international development. We are sure that empirical results provide good advice for effective policies addressed to better quality of life in all the countries of the World.

In section 2 we present a review of economic literature on the consequences of poor production per capita on poverty and undernourishment.

In section 3 we analyze the evolution of Agriculture and production per capita and by sector, showing the great importance of Agriculture and Industry in order to increase income per capita and contribute to poverty eradication.

Section 4 analyses food production, net trade balance of food, and the importance of safe water and sanitation to avoid illness and contribute to improve quality of life. Section 5 presents the main conclusions, and in the Annex we include interesting links to other studies related with international cooperation to development.

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\*Maria-Carmen Guisan, Editor of *Regional and Sectoral Economic Studies* and Honorary Professor of Economics, e-mail: [mcarmen.guisan@gmail.com](mailto:mcarmen.guisan@gmail.com) and Pilar Exposito, Associate Professor of Economics, University of Santiago de Compostela, Spain.

## 2. Literature on Undernourishment, Poverty and Production per capita.

### *Undernourishment, Agriculture and food perspectives*

Accordingly to FAO (2020), as seen in table A1 of the Annex, prevalence of undernourishment has decreased from 14.5% in 2005 to 10.9% of World population in 2017, but it affects to a huge amount of 829.8 million people in 2017, given the increase in World population. In the poorest African areas, it has evolved around 20% of population for each year of the period 2005-2016.

The percentage of population affected by poverty, with its negative consequences on sanitation, health, and quality of life, is much greater than the percentage of people suffering undernourishment.

WHES(2018) points to poverty and conflict as the main causes of undernourishment:

*"The world produces enough food to feed everyone. For the world as a whole, per capita caloric availability and food diversity (the variety of food groups in a diet) have increased between the 1960s and 2011 (FAO, 2017). This growth in food availability, along with improved access to food, helped reduce the percentage of chronically undernourished people in lower-middle-income countries from about 30 percent in the 1990-92 to about 13 percent two decades later (FAO, 2017). A principal problem is that many people in the world still do not have sufficient income to purchase (or land to grow) enough food or access nutritious food. This is an element of "food security". "As of 2013, when the most recent comprehensive data on global poverty was collected, about 767 million people are living below the international poverty line of less than \$1.90 per person per day (The World Bank, 2016)."*

*"In addition, most of the 19 countries listed by FAO as countries in complex, prolonged conflict are located in Africa (FAO et al., 2017).*

*"In 2016, the average prevalence of undernourishment in countries undergoing conflict was about four percentage points greater than the prevalence in non-conflict countries (FAO et al., 2017). About 75 percent of children in the world who are stunted live in conflict areas (FAO et al., 2017)."*

Many experts on Agriculture, environment and related fields, have shown their concern about the future of sustainable development in a World with more than 7 bn inhabitants and with perspectives to reach more than 9 bn people by year 2050.

One interesting article by Gerten, Heck, Jägermeyr et al (2020) explains that to reach Agriculture development, environmentally sustainable, to feed the future population should be needed changes in average human diet, with less proteins from animal origin and more from legumes, and other sources, and to diminish the high amount of food losses. They cite interesting articles related with the future of food production and sustainable development published in Nature, Earths Future, Science, Water Resource and other journals, cited at the article Website, as well as interesting reports by FAO, WHO and other institutions.

OWID (Our World in Data), is an interesting initiative from the university of Oxford, promoted by the social historical and development economist Roser, provides data for long periods and different areas of the World. At this institution Roser and Ritchie (2020), present a summary of the World situation in this regard: *"1) 11% of the world's population are undernourished – this means they have a caloric intake below minimum*

*energy requirements. 820 million people globally are undernourished. 2) 22% of children younger than five are 'stunted' – they are significantly shorter than the average for their age, as a consequence of poor nutrition or repeated infection. 3) Food insecurity 9% of the world population – around 697 million people – are severely food insecure and one-in-four people globally – 1.9 billion – are moderately or severely food insecure."*

*Poverty, sustainable development, population, production per head and cooperation*

Although there are a general consensus to eradicate undernourishment and get sustainable development in order to provide secure food to all the World population, there is less consensus regarding the measures to follow in order to eradicate poverty and to increase quality of health and quality of life in all the countries, particularly less developed ones. The voices of economists are important in this regard because Economics research for the last decades have shown the way that countries may follow to get out of poverty and to keep sustainable development. Some interesting articles in this regard are the following ones:

Guisan, Aguayo and Exposito(2001a,b) analyze the rates of growth of production, population and production per capita in Europe, America, Africa, Asia and other areas. Having into account that the exponential rates of growth of production per capita is exactly the difference between the rate of growth of production and the rate of growth of population, we may notice that countries and areas with low levels of production per head need to increase the rate of growth of production and to moderate the rate of growth of population, if they try to foster economic development. Another interesting conclusion of these studies is that the educational level of population is of uppermost importance to moderate the number of children per woman and to contribute to increase investment per capita and production per capita.

In Guisan(2020) and Guisan and Exposito(2020) we show that the 87% of increase of CO2 emissions for the period 1970-2017 is related with population growth and only 13% with increase of the average emissions per capita. Accordingly to FAO(2018) United Nations forecasts of population is more than 9000 million people for year 2050, and that seems to be excessive given the environmental problems of the World and the negative climate changes that this implies. International cooperation for education is important, together with other measures of support, to give opportunities to women and families to choose moderation of average population growth. Families may have different sizes, accordingly to several circumstances, but the important, for sustainable development, is to moderate the average rate in countries with excessive average fertility rates.

There are few studies highlighting the important role of education and the great importance of industry, and other factors of development, to get sustainable development and eradicate poverty and many of its negative consequences (losses of life expectancy, increases of diseases, increase of disability, low levels of access to safe water and sanitations, and other ones). There is a general consensus to increase cooperation for development, but very few reports to say "how" to get it. This article insists on "how" go improve international cooperation in this regard.

In the book by Arvin and Lee(2015) there are data and analyses about the main measures to increase international cooperation for development. The book includes a chapter by Guisan, Aguayo and Exposito(2015) that includes a quantitative analysis of several channels in order to foster international cooperation, both public and private.

There is an unvaluable positive work made by many economists, staff of statistical institutions and other professional and scientific researchers to provide good insights on many questions related with World development. In spite of that, we are sorry to notice that unfortunately those voices scarcely heard in the social media and that many political and economic powers seem to have little interest in this regard. It is important to foster channels of information and initiatives to improve international cooperation. In the Annex we include some comments in this regard.

### 3. Poverty, production per capita and by sector, and international cooperation.

Table 1 presents a summary of the percentage of people on Poverty around 2010-2018. In table A1 in the Annex we include more information at country level.

Table 1. Percentage of Poverty 5.5 USD per capita a day, 2010-2018, by continent

Continent	Highest % of Poverty	Lowest % of Poverty in each continent
Africa	44 countries with more than 50%	Lower than 33%: Algeria (29), Gabon(32), Mauritius(18), Morocco (31), Seychelles (7), Tunisia(18)
America	13 countries with more than 25%: Belize, Colombia, El Salvador, Guatemala, Guyana, Haiti, Honduras, Jamaica, Mexico, Nicaragua, Trinidad and Tobago, Suriname, Venezuela	Lower than 10%: Argentina (7), Chile (6), Canada (1), USA (2), Uruguay (2.9)
Asia	17 countries with more than 50%	Lower than 33%: China (27), Iran (12), Israel (3), Japan (1), Jordan (18), Korea South (1), Lebanon (2), Mongolia (32), Palestina (24), Thailand (8), Vietnam (29)
Europe and Eurasia	4 countries with more than 25%: Albania, Armenia, Georgia, Romania	Lower than 1% and between 1 and 3%. <i>Below 1%:</i> Austria, Belarus, Belgium, Cyprus, Czech R., Denmark, Finland, France, Germany, Iceland, Ireland, Luxembourg, Malta, Netherlands, Norway, Slovenia, Sweden, Switzerland, United Kingdom. <i>Between 1 and 3%:</i> Hungary (2.7), Spain (2.9)
Oceania	7 countries with more than 50%	Lower than 35%: Australia (1), New Zealand, Samoa, Tonga
Data Not Available (NA)	32 countries or territories Many of them with % of Poverty >50%	

Source: elaborated from World Bank data and table A1 of the Annex, from a list of 196 countries and territories, including small islands and other small territories.

The main cause of high percentages of poverty is the lack of enough production to feed and provide goods and services to all the population of a country or territory. Income per head usually increases when the rate of real growth of production is higher than the rate of growth of population. The educational level of population is one of the most important factors of development, because it helps countries to increase production and to moderate excessive average fertility rates, and thus to eradicate poverty.

Even in the more developed countries, with general income per capita higher than 5.5 USD a day, there are many problems related with poor conditions in many aspects of life, particularly in the case of countries without public or private institutions providing cheap or free important goods and services for nutrition, health assistance or education. There are important differences among countries in this regard. A more complete analysis, in case of available statistics, might include provision of public or community goods and services, besides private income per capita, in order to measure poverty.

With percentage of poverty equal or below 3% appear 2 countries in America (Canada and USA), 4 countries in Asia (Israel, Japan, Korea and Lebanon) and the 21 European countries that appear in table 1. That represent only 14% of the countries and territories analyzed, and thus a small part of World population. China and India and other most populated countries not included in table 1 have experienced improvements, with poverty diminution, for the last 50 years (1970-2020) but some degree of poverty, unfortunately, yet affects to several millions of their inhabitants.

The number of poor people in the World is yet too high: From WB data we may notice that, at World level, the percentage of people below 5.5 USD (at 2011 PPP), although had experienced a slight decline (from 53.9% in year 2010 to 46.1% in year 2015), is very high, particularly in many of the poorest countries and areas of the World with percentages higher than 50% and even, in some cases, higher than 80%. Besides many among the 32 countries and territories with not available (NA) data are as poor as the countries with the highest percentages of poverty.

Settimo(2015) includes data of the evolution on extreme poverty in the World, given by the number of people below 1.25 US Dollars (USD) at 2005 prices and Purchasing Power Parities (PPP). The number evolved from around 2000 million (1920 million) in year 1990 to around 1000 million in year 2015 (1011 million).

Guisan and Exposito(2010) show the evolution of poor population for 2000-2005, as seen in the table of the Annex, with around . Besides, estimations for the period 2005-2015 indicate a diminution of extreme poverty, because people with less than 3.20 Dollars a day in 2015 (equivalent to 2 Dollars in 2005) amounted to 1900 million people. It is an impressive amount, although lower than in year 2005.

In tables 2 to 4 we analyze the low levels of production per capita in the poorest countries. In the Annex we include a reference to the changes in the educational level of population and population growth in developing countries.

The non weighted average of the last column of these tables is 90.84 in table 2, 79.18 in table 3, and 43.28 in table 4, showing a decrease of poverty when there is an increase of production in Agriculture and Industry. Of course, the average percentage of poverty is much lower in countries with levels of production in Agriculture and Industry higher than 3000 Dollars.

Table 2. Countries with production per capita ,in Agriculture&Industry, below 1000 USD at 2011 PPP in year 2017, and percentages of population in poverty.

	Agriculture and Industry	Services	Total	% Poverty 1.5 \$	% Poverty 2.5 \$	% Poverty 5.5 \$
Benin	922	1147	2069	49.5	76.2	90.6
Burkina Faso	832	865	1697	43.7	76.4	92.3
Burundi	265	406	671	71.8	89.3	96.8
Central African R	400	347	746	66.3	83.1	92.8
Congo DR	500	308	808	76.6	91.0	97.7
Ethiopia	989	735	1724	27.3	62.2	85.0
Madagascar	736	912	1648	77.6	91.0	97.3
Malawi	467	687	1154	70.3	89.4	96.7
Mozambique	633	657	1289	62.4	81.5	91.8
Niger	511	410	921	44.5	76.9	93.4
Rwanda	883	1006	1889	55.5	79.7	91.6
Sierra Leone	919	485	1404	52.2	81.3	84.7
Togo	599	939	1538	49.2	73.2	90.1
Uganda	794	974	1768	41.7	69.9	87.8
Zimbabwe	911	1658	2568	21.4	47.2	74.0

Source for Tables 2, 3 and 4: Elaborated from WB statistics. Data of 132 countries or territories (see the list and more information in the Annex). Note: PPP means Purchasing Power Parities.

Table 3. Countries with production per capita inAgriculture&Industry between 1000 and 2000 USD at 2011 PPS in year 2017, and percentages of population in poverty.

	Agriculture and Industry	Services	Total	Poverty 1.5 \$	Poverty 2.5 \$	Poverty 5.5 \$
Bangladesh	1496	2138	3634	14.8	52.9	84.5
Cambodia	1981	1673	3654	NA	NA	NA
Cameroon	1314	1999	3313	23.8	44.7	68.9
Chad	1109	645	1754	38.4	66.5	86.2
Cote d'Ivoire	1649	1915	3565	28.2	57.4	82.3
Guinea	1124	1030	2154	35.3	70.3	92.3
Haiti	1310	343	1653	25.0	50.8	78.9
Honduras	1757	2712	4469	17.2	31.6	52.6
Kenia	1530	1431	2961	36.8	66.2	86.5
Kyrgyz	1351	2042	3394	1.5	19.6	66.4
Lesotho	1195	1652	2847	59.7	78.1	89.9
Mali	1140	879	2019	49.7	79.3	94.9
Mauritania	1938	1719	3657	6.0	24.1	58.8
Nepal	1054	1560	2613	15.0	50.8	83.0
Pakistan	1941	2824	4765	3.9	35.0	75.0
Senegal	1351	1882	3232	38.0	67.5	88.1
Tajikistan	1410	1514	2924	4.8	20.3	54.2
Tanzania	1512	1297	2809	49.1	79.0	93.1
Yemen R	1156	1248	2404	18.8	52.2	81.6
Zambia	1536	2181	3718	57.5	74.3	87.2

Table 4. Countries with production in Agriculture and Industry per capita between 2000 and 3000 USD at 2011 Prices and PPS in year 2017, and percentages of population in poverty

	Agriculture and Industry	Services	Total	Poverty 1.5 \$	Poverty 2.5 \$	Poverty 5.5 \$
Bolivia	2581	4218	6799	5.8	11.8	24.7
El Salvador	2189	5058	7247	1.9	8.5	29.0
Georgia*	2691	7481	10172	5.0	16.3	43.6
Ghana	2045	2006	4051	13.3	30.5	56.9
Guatemala	2622	4801	7423	8.7	24.2	48.8
India	2744	3772	6516	21.2	60.0	87.0
Jamaica	2126	6031	8157	1.7	9.1	29.7
Jordan	2788	5612	8400	0.1	2.1	18.1
Lao PDR	2973	3337	6310	22.7	58.7	85.0
Lebanon*	2043	9604	11647	0	0	1.9
Moldova	2079	4155	6234	0.1	1.1	16.3
Morocco	2892	4617	7509	1.0	7.7	31.3
Nicaragua	2071	3098	5169	3.2	12.8	34.8
Nigeria	2310	3042	5351	53.5	77.6	92.1
Papua NZ	2137	1820	3957	38.0	65.6	86.9
Ukraine	2653	5253	7907	0.1	0.5	6.4

Note : \* Poverty count data for Georgia and Lebanon need some supplementary information: See Borgen(2020) and information at the Annex. Source of data: indicated below table 2.

Many countries. of tables 2 to 4, present very low values per capita in the sum of Agriculture and Industry, below the World average of 4999 Dollars of table 5. Tables 5a and 5b show production per capita, by sector, in the World.

Table 5a. Production per capita, by sector and area, in year 2017.Dollars at 2011 PPP.

	Agri culture	Indus try	Agriculture & Industry	Services	Total	Popula tion
East Asia & Pacific	779	5600	6379	10133	16511	2310
Europe & Central Asia	609	6910	7519	22576	30095	915
Latin America & Caribbean	682	3505	4187	10265	14452	635
Middle East & North Africa	931	7132	8063	10158	18222	441
North America	489	9723	10212	43188	53400	362
South Asia	960	1529	2489	3476	5965	1790
Sub-Saharan Africa	558	897	1455	2080	3534	1050
World	757	4242	4999	10543	15542	7503

Table 5b. Production per capita in less developed countries (LDCs), EU and OECD

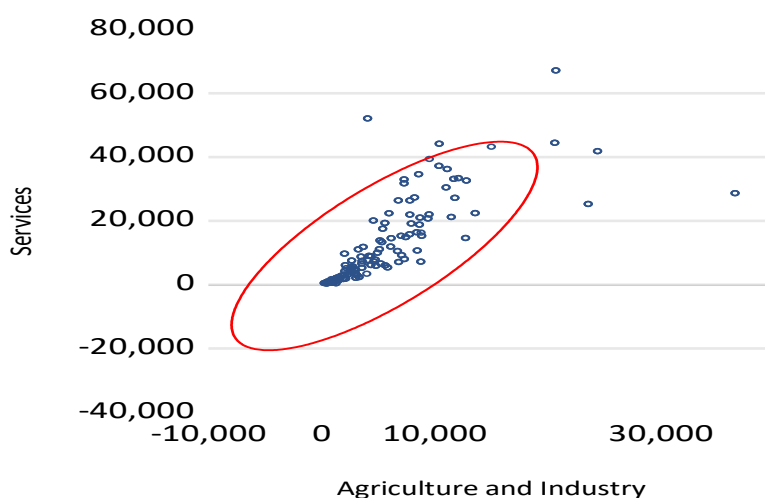
	Agri culture	Indus try	Agriculture & Industry	Services	Total	Popula tion
European Union	585	8120	8705	28720	37425	512
Least developed countries	533	718	1251	1344	2594	986
OECD members	569	8864	9433	30398	39831	1300
World	757	4242	4999	10543	15542	7503

Note: Elaborated by Guisan and Exposito from WB statistics. Services is the difference between Total and the sum of Agriculture and Industry. Industry includes Energy, Manufacturing and Building. World figures are the weighted averages of the seven rows of table 5a.

In a few cases some countries of table 3, like Georgia and Lebanon have a value of Services higher than expected accordingly to their level of production in Agriculture and Industry, due to factors like tourism arrivals or other ones. Tourism and international trade, among other activities, may contribute to middle or high values of production per capita in services, besides the important positive impact of Agriculture and Industry.

Graph 1 shows the positive impact of Agriculture and Industry on services, although there are other factors that also have impact, as explained in the Annex.

Graph1. Production in Services and production of Agriculture and Industry  
(Dollars per capita al 2011 prices and PPPs)



Source: Elaborated by Guisan and Exposito, with data of Table of GDP per capita of 132 countries in year 2017 See Annex.

Accordingly to our econometric models, an increase of one unity on the production per capita of Agriculture and Industry may produce more than two unities of increase in production of Services, and thus 3 unities of increase in total production per capita. An increase of 1000 Dollars per capita in Agriculture and Industry may have an important effect of an increase of 3000 Dollars in total production per capita.

We may notice that a few countries show particular effects of other variables, to explain highest levels of development of Services, than expected accordingly to their production of Agriculture and Industry, due to the effect of missing variables like tourism, foreign trade, investment abroad or other ones, as explained in the Annex.

There are huge differences among the most productive areas, with total production higher than 50000 Dollars per capita, and the poorest ones with less than 5000. International cooperation is of uppermost importance to increase the level of the poorest without diminishing development and quality of life in the richest areas.

Policies to increase the level of production per head in Agriculture and Industry are very important to eradicate hunger, and to avoid poverty, for several reasons: 1) high values of Agriculture implies more domestic production of food and more capacity to feed population and, in some cases, increases the capacity to export. 2) High values



of Industry increase the capacity to export several goods and to increase imports of food if necessary. 3) High values of Agriculture and Industry have an important positive effect on Services, increasing the real Gross Domestic Product per capita and providing employment, wages and private and public resources to avoid poverty.

If the World population would get stable around 8000 million people it will be easier to achieve the objectives of poverty eradication and stabilization or diminution of environmental damage, than in the case of population increases until 9000 or 10000 million inhabitants. Perspectives of World population by UN(2017) are of 8600 million people in year 2030, 9800 in year 2050 and, a trend towards 11200 for year 2100. The real growth of population may be lower, particularly if the educational level of population increases in countries with very high fertility rates. As seen in Guisan, Aguayo and Exposito(2001), and in other studies, the most important impact on moderation of excessive average fertility rates of a country is the educational level of population.

Regarding Poverty and undernourishment, besides the levels of production per capita, there are other important factors, like wars and conflicts and natural disasters. All these questions need attention of international institutions but here we concentrate on the analysis of main economic factors.

#### 4. Food production, net trade balance and availability of safe water.

Tables 6 and 7 show the evolution of production of food in the World, as well as data of population and production per capita, for the period 1979-2017. Evolution of prices is shown in FAO(2020).

Table 6. World Production (thousand Tms, million Kg) for 1979-2017 and Population (million people)

Production And Population	1979	2007	2017	Factor 2017/1979	% of increase 1970-2017
Maize	397371	792733	1841528	4.63	363
Wheat	424144	606681	771719	1.82	82
Rice	375239	656556	769658	2.05	105
3 Cereals	1196754	2055970	3382905	2.83	183
Chickpeas	7587	9662.261	14722	1.94	94
Beans (dried)	4481	3892.723	5370	1.20	20
Lentils	1284	3225.085	6393	4.98	398
3 Legumes	13352	16780	26485	1.98	98
Soybeans	88698	219793	353027	3.98	298
Potatoes	283332	314208	388191	1.37	37
Milk	420403	648220	827880	1.97	97
Meat	138143	-	333600	2.41	141
Fish	72380	-	173000	2.39	139
Population	4358	6675	7511	1.72	72

Source:Elaborated from FAO statistics.World Population from WB(2020).

Retrieved on 6th March 2020.

Table 7. Production per Capita in the World (kg per inhabitant and year)

Product	1979	2007	2017	Factor 2017/1979	% of increase
Maize	91	119	245	2.69	169
Wheat	97	91	103	1.06	6
Rice	86	98	102	1.19	19
3 Cereals	275	308	450	1.64	64
Chickpeas	1.74	1.45	1.96	1.13	13
Beans (dried)	1.03	0.58	0.71	0.69	-31
Lentils	0.29	0.48	0.85	2.93	193
3 Legumes	3.06	2.51	3.53	1.15	15
Soja bean	20	33	47	2.35	
Potatoes	65	47	52	0.80	-20
Milk	96	97	110	1.14	14
Meat	32	na	44	1.37	37
Fish	17	na	23	1.35	35

Source: Elaborated from FAO statistics. World Population from WB(2020). Retrieved on 6th March 2020.

Table 6 shows total production, in million tonnes of *Cereals*, *Legumes*, *Potatoes*, *Milk* *Meat* and *Fish*. The last column of the table shows the percentage of increase for the period 1979-2017. The last row of the table includes World population in each year. We may notice that in several goods the percentage of increase of production was higher than the percentage of population increase, what means that the values of production per capita, and consumption per capita, have increased and undernourishment has decreased in many areas of the World.

Table 7 includes data of production per capita, in kilogrammes per inhabitant, calculated from table 6, dividing each value of production by the population of the corresponding year.

For the period 1979-2017 There was a great increase of production per inhabitant of maize (169%) and a more moderate amount of wheat (6%) and rice (19%). The increase of production per capita of milk was also moderate (14%) and the production of potatoes per capita diminished by 20%. We may notice that production of many foods increased by a higher percentage than population, what means that there has been an increase in quantity of food per capita.

*Hen eggs*: Besides, a popular food, *hen Eggs*, has also experienced an important increase both in total and in per capita terms. Total Production of hen Eggs evolved from 463 Bn in year 1979 to 1120 in 2007 and 1340 Bn in year 2017, multiplying by a factor of 2.89, and a percentage of increase of 189%. Production of Eggs per capita evolved from 106 in 1979 to 168 in 2007 and to 178 in year 2017. This variable multiplied by a factor of 1.68 what implies an increase of 68% per cent.

*Net trade of Food:* In the Annex we include tables with the evolution for the years 1995, 2005 and 2016. In the next table we include the net trade of each continent in year 2016

Table 8 Net trade of Food by continent, year 2016 (million USD)

Continent	Cereals & preparations	Fruits & Vegetables	Meat & Preparations	Diary prod. (milk equivalent)	Fish	Sum
Africa	-22374	7982	-3596	-3515	1528	-19975
America	17987	17537	22585	-1227	68	56950
Asia	-35852	-8661	-36186	-14679	10708	-84670
Europe	24766	-30029	6649	9581	-6039	4928
Oceania	4825	2812	11330	8456	1227	28650

Source: Elaborated from FAO(2020). Pocket book.

At country level there is not problem if a country has low production of cereals but may buy them, at international markets, thanks to its industrial exports or to other resources, but there is a big problem when countries do not afford to pay for the food and resources that they need.

#### *Poverty, health, safe water and sanitation*

As seen in the Annex, among a list of approximately 200 countries and territories, at the WB data, we find 113 with not available data (NA) for safe water and 123 for sanitation.

Among the countries with available data there are many countries with less than 25% of population with safe water and sanitation systems, and there are also many countries in the groups of 25-50% of population, and 50-75%. Only 38 countries got to show percentages of population higher than 85% with good systems of sanitation (16 countries with percentage between 85-95% and 22 countries with percentage between 95-100%). There are more countries and territories with high percentages of safe water: 49 with percentage over 95% and 22 between 85-95%.

As seen in Guisan and Exposito(2013), and other studies, there are negative consequences of poverty on health, due to lack of prevention and low level of resources for health assistance which lower Life Expectancy and quality of life in many countries.

## **5. Conclusions**

Poverty eradication, sustainable development, with diminution of environmental contamination, and increase in quality of life in all the countries, require to have into account some important conclusions:

1) UN(2017) perspectives of World population are of 8600 million people in year 2030, 9800 in year 2050 and, a trend towards 11200 for year 2100. We think that the real growth of population may be lower, if the educational level increases in countries with very high average fertility rates because, as seen in the article by Guisan, Aguayo and Exposito(2001) and other studies, the most important impact on moderation of excessive average fertility rates of a country is the educational level of population. If World population stabilizes around 8600 million people, instead of 9000 or more, the opportunities for quality of life and poverty eradication will be higher for many people.

2) Accordingly to our analysis (see Guisan(2020) and Guisan and Exposito(2020)), the 87% of increase of CO<sub>2</sub> emissions in the World, for the period 1970-2017, is related with high demographic growth in many countries and only 13% with the slight increase of the average emissions per capita. It is important to diminish average emissions per capita but it is also important to moderate average fertility rates.

3) As seen in section 4, Food production per capita has increased in the World and that has helped to diminish or eradicate hunger in many countries, but safe water and sanitation need to be improved in many countries, in order to eradicate one of the worst consequences of poverty that is the damage to health.

4) International cooperation, both private and public, is of uppermost importance to help to eradicate poverty and foster sustainable development and quality of life. International cooperation for education, investment, production per head, peace, quality of government should be supported by citizens and private and public institutions. There are several channels to favor international cooperation, not only donations, but also investment and trade. Besides institutional support citizens may contribute.

5) ¿What is the role of citizens to foster economic cooperation for World development? Associations of citizens, scientific researchers, universities, schools, charitable organizations, firms and journalists with educational, social or environmental commitment, have opportunities to defend a better World in order to promote peace, hunger eradication and quality of life. Support from TV and social communication means is very important in this regard, as well as the role of social organizations addressed to inform society and politicians on development policies.

Some actions that help to improve cooperation with developing countries, from citizens and citizens organizations (firms, associations, etc.), are: 1) Citizens right to donations for international cooperation free of taxes. 2) Social support to institutions that guarantee clear and fair use of the funding, 3) Channels to contribute to support the costs of education (teachers salary, school buses (particularly needed to guarantee transport security for female students in some countries), as well as meals, materials, or other aids, for children in low income countries). 4) Channels to contribute to investment in basic infrastructures for development, in order to get safe water, sanitation, roads, and other ones. 5) Channels for investment in production of goods and services and to create employment, and good quality of life: Investment is easy to get from citizens if shareholders get some degree of financial security from public institutions.

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<https://euroamericanassociation.blogspot.com>

## Annex 1. Borgen Project:

### Overview of global poverty

- 736 million people live in extreme poverty. About half of the world's poor, around 368 million, [live in just five countries](#): India, Nigeria, the Democratic Republic of the Congo, Ethiopia and Bangladesh.
- In developing regions, one in 10 people [live on less than \\$1.90 a day](#).
- An estimated 2.5 billion people [lack access to improved sanitation](#) (more than 35 percent of the world's population).
- One billion people live without electricity and [hundreds of millions more](#) live with unreliable or expensive power.

Incentivating female education in India

<https://borgenproject.org/blog/>

Poverty

<https://borgenproject.org/top-10-crucial-to-know-facts-about-poverty-in-lebanon/>

Some facts of Poverty in Lebanon, (from Borgen: Top 10 Facts about Poverty in Lebanon

- More than 25 percent of Lebanese citizens live in poverty.
- A person living below the poverty threshold in Lebanon earns less than \$266 per month.
- Children in [poor families](#) are less likely to be able to complete their education. This can trap them in low-skill, high-demand job-markets.
- As many as 20 percent of Lebanese citizens live with unimproved sanitation facilities; 10 percent of poor households have no access to clean drinking water.
- There are more than [one million refugees](#) in Lebanon,
- Nearly half a million Palestinian refugees are registered with U.N. relief organizations in Lebanon. Palestinians may make up as much as 10 percent of the [country's population](#) but they lack several important rights. Many live in U.N. camps in extreme poverty and are denied access to certain types of work.
- Social safety programs are rare and inconsistent in Lebanon. Many families are forced to go hundreds or thousands of dollars into debt to cover unexpected expenses like medical bills.

More information: <https://borgenproject.org/global-poverty/>

### Poverty is the principal cause of hunger

- As of 2018, 822 [million people are hungry worldwide](#); that's one in nine people.
- Over 2 billion people lack regular access to safe, nutritious, and sufficient food (about 18 percent).
- 785 million people drink unsafe water or have to travel more than [30 minutes to drink safe water](#).

### What would it cost to end world hunger by 2030?

World hunger can be eliminated with an additional \$265 billion per year in additional resources.

List of Top 10 Facts About Poverty in Georgia

1. While poverty [decreased in 2014](#) for the fourth consecutive year, according to the World Bank, it still affects one-third of Georgia's population.
2. According to the World Bank, the overall population living in poverty in Georgia is 32 percent. Out of which, [28 percent](#) are children. The good news is that people suffering from poverty in Georgia usually get out of it in less than a year.

**Annex 2. Production per capita by sector in year 2017**

Table A1. Production per capita in 2017 and population (Pop) for 2000-2017 in 132 countries (Dollars per inhabitant at 2011 prices and Purchasing Power Parities)

Country	Agri culture	Indus trie	Serv ices	Total	Pop 2000	Pop 2017	(7) %
Albania	2243	2404	7150	11797	3062	2873	-6.17
Algeria	1651	5170	7001	13822	30463	41389	35.87
Angola	606	2549	2890	6045	13841	29817	115.43
Argentina	1038	4143	13764	18945	36896	44045	19.38
Armenia	1311	2257	5177	8745	3082	2945	-4.45
Australia	1209	10491	33081	44781	19153	24602	28.45
Austria	547	11570	33305	45421	8012	8798	9.81
Azerbaijan	893	7917	7119	15929	8049	9854	22.43
Bangladesh	487	1009	2138	3634	128916	160000	24.11
Belarus	1301	5425	10467	17193	10005	9498	-5.07
Belgium	275	8330	34529	43133	10252	11375	10.95
Benin	476	446	1147	2069	7197	11175	55.27
Bolivia	788	1793	4218	6799	8317	11193	34.58
Botswana	322	4823	11021	16165	1754	2205	25.71
Brazil	660	2613	10963	14236	173858	208000	19.64
Bulgaria	757	4590	13259	18606	8060	7076	-12.21
Burkina Faso	481	351	865	1697	11292	19193	69.97
Burundi	191	74	406	671	6486	10827	66.93
Cambodia	854	1127	1673	3654	12744	16009	25.62
Cameroon	476	838	1999	3313	14856	24566	65.36
Canada	NA	NA	NA	43871	30770	36540	18.75
C.Afri.R.	245	155	347	746	3777	4596	21.68
Chad	853	257	645	1754	8216	15017	82.78
Chile	864	6601	14832	22297	15412	18470	19.84
China	1154	6184	7916	15254	1262645	1390000	10.09
China H-K	37	4044	52013	56094	6665	7392	10.91
Colombia	842	3536	8808	13186	42120	48901	16.10
Congo DR	159	341	308	808	50052	81399	62.63
Congo R	327	2731	2045	5103	3438	5111	48.66
Costa Rica	774	2931	11726	15430	3929	4950	25.99
Cote d'Ivoire	769	880	1915	3565	16735	24437	46.02
Croatia	671	4765	17425	22861	4380	4125	-5.82
Czech R	670	10819	21082	32571	10273	10594	3.12
Denmark	679	9733	37143	47555	5340	5765	7.96
Dominican R	795	4177	9909	14880	8265	10513	27.20
Ecuador	975	3400	6079	10454	12306	16785	36.40
Egypt AR	1226	3602	5845	10673	67285	96443	43.34
El Salvador	365	1824	5058	7247	6280	6388	1.72
Eritrea	NA	NA	NA	NA	3557	NA	NA
Estonia	704	7131	21868	29704	1370	1317	-3.87
Ethiopia	583	407	735	1724	64298	106000	64.86
Finland	962	10079	30403	41443	5176	5508	6.41



France	605	6703	31649	38956	58896	66865	13.53
Georgia	635	2056	7481	10172	4720	3728	-21.02
Germany	377	12457	32559	45393	82210	82657	0.54
Ghana	798	1247	2006	4051	19867	29121	46.58
Greece	911	3700	19991	24602	10917	10755	-1.48
Guatemala	747	1876	4801	7423	11166	16915	51.49
Guinea	442	682	1030	2154	8434	12068	43.09
Haiti	296	1014	343	1653	7939	10982	38.33
Honduras	574	1183	2712	4469	6424	9429	46.78
Hungary	1027	6921	19084	27032	10211	9788	-4.14
India	1018	1727	3772	6516	1015923	1340000	31.90
Indonesia	1468	4396	5297	11161	206265	265000	28.48
Iran, IR	1814	6667	10617	19098	63664	80674	26.72
Ireland	776	23645	41711	66132	3813	4807	26.07
Israel	384	6427	26312	33123	6289	8713	38.54
Italy	697	7546	27248	35491	57690	60537	4.93
Jamaica	541	1585	6031	8157	2589	2921	12.82
Japan	463	11339	27105	38907	126870	127000	0.10
Jordan	466	2322	5612	8400	4755	9779	105.66
Kazakhstan	1088	7783	15207	24079	14884	18038	21.19
Kenya	1031	499	1431	2961	30689	50221	63.64
Korea R	705	12891	22343	35938	47008	51466	9.48
Kuwait	342	36245	28579	65167	2190	4056	85.21
Kyrgyz R	425	927	2042	3394	4915	6198	26.10
Lao PDR	1022	1951	3337	6310	5279	6953	31.71
Latvia	863	4763	19233	24859	2372	1942	-18.13
Lebanon	341	1703	9604	11647	3398	6812	100.47
Lesotho	174	1021	1652	2847	1788	2091	16.95
Lithuania	1041	7679	20948	29668	3500	2828	-19.20
Macedonia North	1036	3171	8932	13140	2010	2082	3.58
Madagascar	405	332	912	1648	16195	25571	57.89
Malawi	301	166	687	1154	11512	17670	53.49
Malaysia	2350	10406	14535	27291	22997	31105	35.26
Mali	774	366	879	2019	11647	18512	58.94
Mauritania	873	1065	1719	3657	2645	4283	61.93
Mexico	608	5530	11817	17956	97966	125000	27.60
Moldova	715	1364	4155	6234	4275	3549	-16.98
Mongolia	1195	4460	5972	11627	2398	3114	29.86
Morocco	928	1964	4617	7509	27838	35581	27.81
Mozambique	323	310	657	1289	17911	28649	59.95
Myanmar	1309	2036	2265	5610	47724	53383	11.86
Namibia	702	2881	6510	10093	1894	2403	26.87
Nepal	708	346	1560	2613	24431	27627	13.08
Netherlands	906	8641	39263	48809	15925	17131	7.57
New Zealand	NA	NA	NA	36046	3858	4794	24.26
Nicaragua	779	1292	3098	5169	4959	6385	28.76
Niger	365	146	410	921	11782	21602	83.35
Nigeria	1116	1194	3042	5351	117608	191000	62.40
Norway	1285	19368	44360	65014	4491	5277	17.50
Pakistan	1092	848	2824	4765	138080	208000	50.64

Panama	524	6527	15192	22244	2950	4107	39.22
Papua-New Guinea	698	1439	1820	3957	5299	8438	59.24
Paraguay	1212	4054	6524	11790	5470	6867	25.54
Peru	849	3918	7751	12517	25952	31444	21.16
Philippines	733	2307	4541	7581	75766	105000	38.58
Poland	761	7921	18696	27379	38648	37975	-1.74
Portugal	592	5402	22263	28257	10226	10300	0.72
Romania	1012	6780	15675	23468	22443	19587	-12.73
Russian F	880	7554	16356	24791	146303	144000	-1.57
Rwanda	585	299	1006	1889	8025	11981	49.30
Saudi Arabia	1234	22375	25195	48804	21484	33099	54.06
Senegal	518	832	1882	3232	10343	15419	49.08
Sierra Leone	846	72	485	1404	4509	7488	66.07
Singapore	23	20711	67027	87760	4018	5612	39.67
Slovak R	720	8706	20632	30059	5389	5439	0.93
Slovenia	583	8938	21928	31449	1989	2066	3.87
South Africa	288	3212	8715	12215	44000	57000	29.55
Spain	956	6878	26291	34126	40500	46593	15.04
Sri Lanka	911	3195	7600	11706	19359	21444	10.77
Sweden	682	10453	36127	47261	8869	10058	13.41
Switzerland	382	14656	43134	58171	7184	8452	17.65
Syria	NA	NA	NA	NA	16813	17068	1.52
Tajikistan	620	789	1514	2924	6159	8880	44.18
Tanzania	807	705	1297	2809	34763	54664	57.25
Thailand	1356	5745	9185	16286	61438	69210	12.65
Togo	363	236	939	1538	5364	7698	43.51
Tunisia	1061	2535	7354	10950	9564	11433	19.54
Turkey	1522	7310	16198	25031	67420	81102	20.29
Turkmenistan	NA	NA	NA	16390	4502	5758	27.90
Uganda	435	360	974	1768	24309	41162	69.33
Ukraine	805	1848	5253	7907	49176	44831	-8.84
United Kingdom	263	7065	32900	40229	59743	66059	10.57
United States	499	9918	44054	54471	282224	325000	15.16
Uruguay	1055	5113	14490	20658	3342	3437	2.84
Uzbekistan	2210	1817	3322	7348	24724	32389	31.00
Venezuela RB	NA	NA	NA	11490	24311	29390	20.89
Vietnam	957	2082	3195	6233	78523	94597	20.47
Yemen R	144	1012	1248	2404	17937	27835	55.18
Zambia	150	1387	2181	3718	10702	16854	57.48
Zimbabwe	248	662	1658	2568	12595	14237	13.04

Source: Elaborated by Guisan and Exposito(2020) from World Bank Statistics. Note: Column (7) in the % of population increase for the period 2000-2017.

Values of column (7) of table A1, depend, mainly, on fertility rates and immigration. Usually high increases in low income countries are due to high average fertility rates (usually in countries with low average levels of schooling) while high increases in rich countries are usually due to attraction for immigration. In other cases, wars, conflicts or natural disasters may explain other demographic movements.

Accordingly to UN(2015) the prospects for total fertility rate is 2.5 children per woman, and they indicate that *"This global average masks wide regional differences. Africa remains the region with the highest fertility at 4.7 children per woman."*

As seen in Guisan, Aguayo and Exposito(2001) and (2015) international cooperation for education is of uppermost importance, not only for the recipients countries but also for global development, because education usually contribute to moderate excessive average fertility rates, to increase savings and investment per capita, increase income per capital, safe water availability, sanitation, health quality and moderate environmental damage, and other positive effects con quality of life.

Guisan and Exposito(2020) analyze how to conceal increase of production per capita with diminution of CO2 emissions (both total and per capita). Guisan and C(2020) analyze the importance of safe water, sanitation and medical care to diminish mortality and to increase health conditions and quality of life in developing countries.

### Annex 3. Poverty, undernutrition, safe water and sanitation

FAO shows that undernutrition in year 2015 was higher than 20% of population in Subsaharan Africa and higher than 10% in South Asia

<http://www.fao.org/3/y3557s/y3557s15.htm#a3>

#### Incidencia de la desnutrición, países en desarrollo

	% de población				Millones de personas			
	1990-92	1997-99	2015	2030	1990-92	1997-99	2015	2030
Países en desarrollo	20	17	11	6	815	776	610	443
África subsahariana	35	34	23	15	168	194	205	183
Ídem, excluida Nigeria	40	40	28	18	156	186	197	178
Cercano Oriente y África del Norte	8	9	7	5	25	32	37	34
América Latina y el Caribe	13	11	6	4	59	54	40	25
Asia meridional	26	24	12	6	289	303	195	119
Asia oriental	16	11	6	4	275	193	135	82

#### Safe Water and Sanitation

% of population	Countries Water	Countries Sanitation
Not available data (NA)	113	123
<25	7	15 (Niger and more)
25-50	12	15 (Brazil and 14 more)
50-75	16	13 (Mexico, Rusia, China and 10 more)
75-85	5	16 (Canada, Ireland and 14 more)
85-95	22	16 (USA)
>95	49	22 (Germany, Spain, UK, Switzerland

Source: Elaborated by Guisan and Exposito(2020) from World Bank Indicators.

**Table 1. Extreme poverty in 2000 and 2005 less than \$2 a day)**

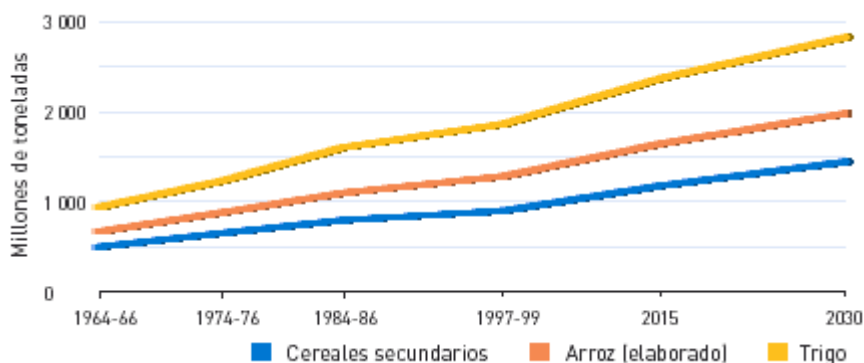
Áreas	% 2000	% 2005	Millones de personas en pobreza extrema en 2005
Asia Este y Pacífico	45.51	36.58	690
Europa y Asia Central	16.67	9.79	46
Latinoamérica y Caribe	25.03	22.17	122
Oriente Medio y Norte de África	22.78	19.70	60
Asia Sur	80.18	77.12	1134
África Subsahariana	75.17	71.97	534
Otros países	..	9.79	99
Total: Mundo	46.81	41.70	2685

Rate of poverty in the World. Elaborated by [Guisan and Exposito\(2010\)](#), [EEDI](#), Vol. 10-1 (in Spanish). See Entry 17 of Blog: <https://economiydesarrollointernacional.blogspot.co>

Access to healthy managed water varies around 27% in Sub-Saharan Africa and low income countries to 74% in Latin America and Caribe and around 98% in the European Union and high income countries, with a percentage around 70% in the World. It is really urgent to provide secured water at home or very close to home to the whole population of the World.

#### Annex 4. Demand of Cereals and Net Trade

Fao. Demanda de cereales



<https://ourworldindata.org/food-prices#citation>

<http://www.fao.org/faostat/en/#data>

Net Trade. Data by continent, from FAO pocket book

### Africa, 1995, 2005, 2016

#### Net trade (mill. USD)

Cereals and preparations	-6 930	-10 702	-22 374
Fruit and vegetables	1 269	2 327	7 982
Meat and meat preparations	-543	-1 553	-3 596
Dairy products (milk equivalent)	-1 604	-2 167	-3 515
Fish	1 658	1 869	1 528

### America

#### Net trade (mill. USD)

Cereals and preparations	13 992	8 750	17 987
Fruit and vegetables	5 743	5 911	17 537
Meat and meat preparations	6 273	11 404	22 585
Dairy products (milk equivalent)	-1 675	-1 605	-1 227
Fish	3 365	1 612	68

### Asia

#### Net trade (mill. USD)

Cereals and preparations	-17 880	-14 816	-35 852
Fruit and vegetables	-1 014	3 562	-8 661
Meat and meat preparations	-10 201	-13 572	-36 186
Dairy products (milk equivalent)	-4 601	-6 235	-14 679
Fish	-6 886	-1 005	10 708

### Europe

#### Net trade (mill. USD)

Cereals and preparations	4 819	7 938	24 766
Fruit and vegetables	-12 776	-20 471	-30 029
Meat and meat preparations	749	-2 201	6 649
Dairy products (milk equivalent)	5 069	5 827	9 581
Fish	-3 546	-7 276	-6 039

### Oceania

#### Net trade (mill. USD)

Cereals and preparations	1 498	2 771	4 825
Fruit and vegetables	837	778	2 812
Meat and meat preparations	4 138	7 926	11 330
Dairy products (milk equivalent)	2 544	5 014	8 456
Fish	1 293	1 164	1 227

Source FAO. Pocket book.

**Annex 5. Articles cited in Gerten et al(2020)**

Journal	Year
Atmos. Chem. Phys. 13, 7997–8018	2013
Biogeosciences 9, 4169–4197 (	2012
Curr. Opin. Environ. Sustain. 29, 98–117 (2017).	2017
Earths Future 4	2016
Ecol.Soc. 22	2017
Report FAO. Food Security Indicators	2019
Glob. Biogeochem. Cycles 13, 647–662 (1999).	1999
<i>Global Environ. Change</i> <b>49</b> , 23	2018, 2013
J. Hydrol. 384, 218–231, 296	2010, 2004
Lancet 393, 447–492	2019
Nat. Clim. Change 8, 151–155	2018
Nat. Sustain. 1, 275–282 <b>1</b> , 88–95.	2018
Nature 495, 461, 468, 490, 562 (2), 528	2013, 2009, 2011, 2012, 2018, 2015
PLoS ONE 13, e0194695 (	2018
<i>Proc. Natl Acad. Sci. USA</i> <b>108</b>	2011
<i>Sci. Total Environ.</i> <b>438</b> , 477–489	2012
Science 347, 360, 345, 353, 344	2015, 2018, 2014, 2016, 2014
Water Resour. Res. 47, W03509	2011
Report World Resources Institute,	2018
Hydrol. Earth Syst. Sci. 18, 5041–5059	2014
Curr. Opin. Environ. Sustain. 5, 392–402	2013
Alterra Report 2251 (Alterra)	2011
Report World in Transition: Governing the Marine Heritage (WBGU)	2013
Phil. Trans. R. Soc. Lond. 368, 20130112	2013
Glob. Biogeochem. Cycles 13, 623–645	1999
Geosci. Model Dev. 11, 1377–1403	2018
Nat. Ecol. Evol. 1, 1625–1634	2017
Nat.Communs.8, 6, 7, 5	2017, 2015, 2016, 2014
<i>Environ. Res. Lett.</i> <b>11</b> , 8, 10, 9(2), 5	2016.2013, 2015, 2014(2), 2010
Glob. Food Sec. 3, 16–21	2014
<i>Ambio</i> <b>46</b> , 4–17	2017
Geosci. Model Dev. 11, 2789–2812	2018

Report The World Database on Protected Areas (WDPA) (IUCN and UNEP-WCMC,	
Report Human-Induced Soil Degradation (International Soil Reference and Information Centre, 1991).	
Report Diet, Nutrition and the Prevention of Chronic Diseases Technical Report Series 196 (WHO, 2003).	
Report “Feeding ten billion people is possible within four terrestrial planetary boundaries” (GFZ Data Services, 2020); <a href="https://doi.org/10.5880/PIK.2019.021/">https://doi.org/10.5880/PIK.2019.021/</a>	

**Annex 6. World Development and International Cooperation****24. Selected Readings on World Development 2015: Handbook on the Economics of Foreign Aid**

Edited by Mak Arvin and Byron Lew, and published by Edward Elgar Publishing.

**Presentation:** "It would be fair to say that foreign aid today is one of the most important factors in international relations and in the national economy of many countries – as well as one of the most researched fields in economics. Although much has been written on the subject of foreign aid, this book contributes by taking stock of knowledge in the field, with chapters summarizing long-standing debates as well as the latest advances. Several contributions provide new analytical insights or empirical evidence on different aspects of aid. As a whole, the book demonstrate how researchers have dealt with increasingly complex issues over time – both theoretical and empirical – on the allocation, impact, and efficacy of aid, with aid policies placed at the center of the discussion" (Presentation at the Publishers Website). More Information (authors, chapters, contents, etc.) at Edward Elgar Websites:

Book in print    Electronic edition [https://www.e-elgar.com/shop/handbook-on-the-economics-of-foreign-aid?website=uk\\_warehouse](https://www.e-elgar.com/shop/handbook-on-the-economics-of-foreign-aid?website=uk_warehouse)

B. Mak Arvin and Byron Lew - 9781783474578  
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via free access

**Short comments on this book by M.C. Guisan**  
**Professor of Applied Economics (Econometrics, USC, Spain), expert on World Development studies at Ideas.Repec**

**Comments (provisional version):** "It is a very interesting book which, in our view, deserves a positive impact on real policies addressed to foster international cooperation to development. The book includes many interesting tables, graphics thoughts and conclusions in this regard, like the following ones, among others:

Part I.

page 54: Evolution of Official Development Aid (ODA),

page 84 Evolution of economic development 1980-2010 in 21 major areas of the World. While in the period 2000-2010 some areas experienced an important increase of real income per head around 300 or 400 Dollars per year, some poorest areas experienced almost stagnation even with less than 50 Dollars per year. The international comparisons call to improve the mechanisms of foreign aid in order to reach the desired goals of quality of life for World population.

page 87: quantitative estimation of the impact of 7 main channels of foreign aid to development. It is interesting to have into account not only ODA but also private philanthropic aid, remittances, trade, investment and other ways. Foreign Direct Investment (FDI) and Foreign Trade (FT) have usually a high impact."

Blog: <https://euroamericanassociation.blogspot.com>

Journal published by the EAAEDS: <https://www.usc.gal/economet/rses.htm>