International Journal of

Poverty, Investment and Development

(IJPID)

CARI Journals

International Journal of Poverty, Investment and Development

Vol. 2, Issue No. 1, pp 1 - 19, 2022

www.carijournals.org

Agriculture and poverty reduction in Cameroon

Godom Moise

PhD student in economics at the University of Yaoundé 2 Soa

Email: m.godom@yahoo.com

Abstract

Purpose: The main objective of this study is to determine the contribution of agriculture to poverty reduction by determining the degree of extension of individual wealth in relation to the increase in agricultural added value.

Methodology: Using data from the World Bank (WDI 2020) and FOASTAT from 1980 to 2018, GDP per capita (indicator for measuring the level of development noted as GDP/H) is regressed on the added value of the agriculture in millions of dollars (AVA) and other variables such as gross national savings (GNS), added value of industries (AVI), and imports of goods and services (IGS).

Findings: The main estimation results of the multiple regression model by ordinary least squares, the overall significance of which is 5%, indicate that: *i) a unit increase in agricultural value added stimulates individual wealth by 0.0594 thousand dollars; ii) a unit increase in gross national savings in turn causes an increase of 0.185 thousand dollars in GDP per capita, iii) the agricultural value added positively influences gross domestic product per capita as well as gross national savings.*

Unique contribution to theory, practice and policy: Thus, for a better standard of living through the increase in GDP per capita, Cameroonian agricultural products must undergo strong transformations in order to generate added values with multiplier effects on individual incomes. Thus, the population must be encouraged to further stimulate their national savings.

Keywords: *agricultural products, Agricultural value added, GDP per capita, individual incomes, Poverty.*

1-Background

The economic crisis of 1980 was partly caused by the drop in prices of the main agricultural cash crops on the world market, which consequently led to a drop in State revenues. On the other hand, Thierry POUCH (2008) decried the increase in the prices of agricultural and food products, but this increase was contrasted according to the products (high for "food agricultural products" and low for "agricultural basic products") generating profits for producers and devastating for importing countries. For Franck Galtier (2012), the instability of the prices of agricultural products in developing countries stems from international markets. This is how some countries, for example Cameroon, have introduced a New Agricultural Policy (NAP) which offers crop diversification by asking farmers to practice more food crops in addition to conventional cash crops. This policy is based on the green revolution with the following extensions: the modernization of the production apparatus, food security, the promotion and diversification of exports, the balance of production sectors and the enhancement of agricultural products through local processing. generating more and more

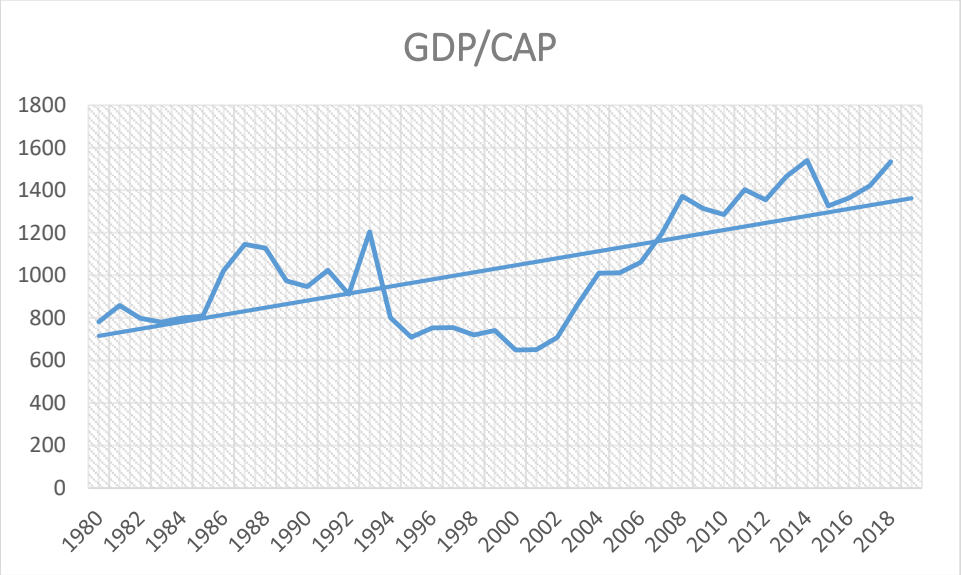
agricultural added value. It should be remembered that agriculture is a main activity, generating income and food for the rural population, whose poverty is more widespread there. Just as in the Strategy Document for Growth and Employment (DSCE) which ended in 2020, the National Development Strategy for 2030 (SND 30), which is its extension, considers agriculture as one of the priorities of the Cameroonian government's vision of "emergence 2035" and should arouse more interest among development actors and partners. In addition, agriculture, livestock, and fishing are the main production activities and the main sources of income in rural areas.

Although the dynamism of agriculture is essential to our economy and the vitality of our territories, the quality of its development and its contribution to the reduction of poverty constitute one of the essential issues. Increasing agricultural production in an economy could bring about considerable transformations for the population in general and the rural population in particular. The positive effects stem from this in terms of improving economic growth and the standard of living of populations living in restricted conditions, through the reduction of the unemployment rate, the guarantee of food self-sufficiency, but it should also be pointed out that the most of the rural population remains poor. It is perhaps for this reason that Cervantes-Godoy, D. and Dewbre, J. (2010) asserted in an article “The economic importance of agriculture in the fight against poverty”, OECD Publishing that, “if economic growth in general has greatly contributed to the reduction of poverty, the way in which it is distributed between the various sectors of activity is far from being without consequences, but the increase in agricultural incomes takes on a non-negligible importance in this respect. negligible”. This assertion leaves ambiguous the contribution of agricultural income to poverty reduction.

2-problem statement

First of all, we must remember with Theodore Schultz (1979) that: “For the most part, the inhabitants of the planet are poor; therefore, studying the economics of poverty would tell us a lot about the economic principles that really matter. Throughout the world, the majority of the poor derive their income from agriculture; therefore, studying agricultural economics would tell us a lot about the economics of poverty.” This assertion made during his acceptance speech for the Nobel Prize in Economics in 1979, Schultz puts here the stamp of interest in the study of agricultural economics on the economics of poverty. In the economic literature, poverty is measured using several indicators, including the level of gross domestic product per capita, the evolution of which over the past 39 years is shown in Figure 1.1 below.

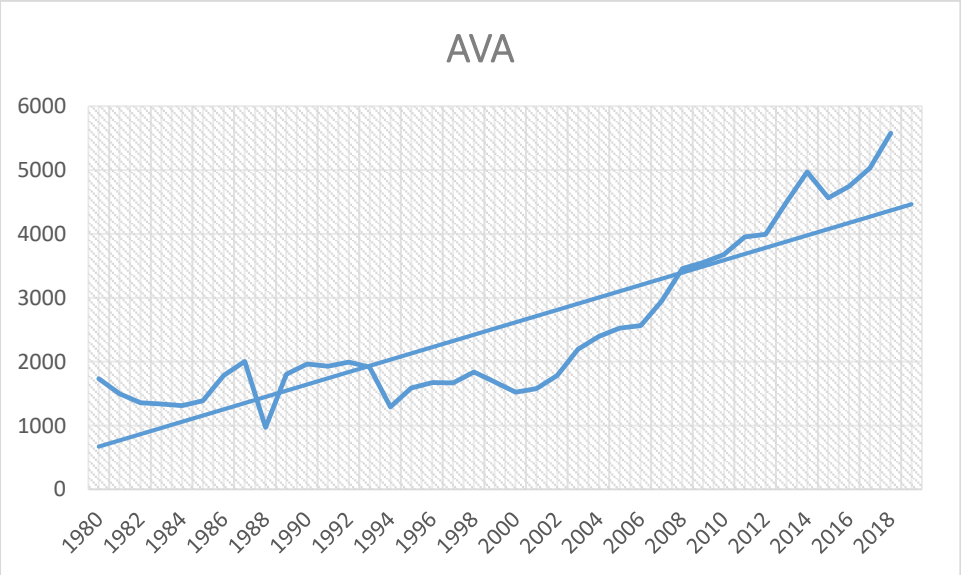
Figure 1. Evolution of GDP per capita in Cameron



Source: Author, via Excel

The overall observation of the evolution of GDP per capita in Cameroon from 1980 until 2018 shows an upward trend. But it must also be pointed out that between 1994 and 2004, GDP per capita remained the lowest in the study interval, oscillating around 651 and 720 dollars per year without taking the extremities into account. On the contrary, in the intervals 1985-1993 and 2006-2018, wealth per capita in the globalized consideration experienced strong appreciations ranging from 1371 to 1540 dollar per year or 3.7 to 4.2 dollar per day per individual if the distribution of wealth is fair. This evolution of per capita wealth has a slight connection with that of added value in agriculture. Since agriculture plays a very important role in GDP growth, its value added is shown in Figure 1.2 below.

Figure 1.2: Evolution of agricultural value added in Cameroon



Source: Author, via Excel

Just like GDP per capita, the agricultural value added curve showed an overall upward trend. The value of 973 million dollars is the lowest value recorded in 1988 and the highest value is that of 5580 million dollars recorded in 2018. This would confirm that since 1980 until today, the added value in agriculture has known and continues to have strong appreciations boosted by policies of development of products resulting from agriculture in general through their transformations.

For our study, poverty reduction is reflected by the increase in gross domestic product per capita (GDP/capita), the growth rate of which was around 7.9% in 2018. Thus, in the light of the observations of the curves of agricultural added value and GDP per capita, their evolution seems to have links of influence. For this reason, with the aim of studying the link between agriculture and poverty in Cameroon, the main question that can be asked is to know what is the impact of an increase in the processed agricultural product on that of wealth per individual in Cameroon? Put differently, will the local processing of agricultural products in Cameroon have a significant impact on wealth per individual?

3. Importance of agriculture in the economy and poverty in Cameroon

The role of agriculture in the development of the economy has been discussed since the Physiocrats in the 18th century who pointed out that agricultural planning dates back to biblical writings. By allowing the accumulation of capital, agriculture is a fundamental source of growth and strongly solicited in the fight against poverty. Indeed, the agricultural sector is a source of food, a provider of jobs and income for a good part of the working population (particularly in developing countries), a source of raw materials for industry and of foreign currency allowing assurance of sustainable growth. This is why Johnson and Mellor (1961) summarized five important contributions of agriculture to the rest of the economy as follows: increasing the supply of food for local consumption; source of raw material for the food industry; expanding market size for industries by increasing demand for manufactured goods; increase in the supply of local savings and ultimately the gain of foreign currency through exports. According to Mounier, A. (1992), economic health in general depends on the good health of agriculture which, according to the theory of agricultural growth, generates economic surpluses which are therefore "absorbed" by other sectors.

3.1 - the contributions of agriculture to the Cameroonian economy

At the start of the 1980s, just before the crisis, the agricultural sector thus positioned itself as the leading employer, employing 68% of the active population, and contributing 30% of GDP with 33% of budgetary revenue. And above all, it ensured food self-sufficiency. Shaken by the ordeal of the crisis and structural adjustment, the agricultural sector has seen its importance somewhat diminish; but it remains a key sector for the revival of economic growth, thanks to a “leading contrition to the national economy”. It constitutes the basis of purchasing power in rural areas. It is the result of three sub-sectors: agriculture proper (subsistence and industrial agriculture), animal production (breeding, hunting and fishing), forestry and logging (wood and wood products, forest products non-timber) (MINADER, 2001).

3.2-Contribution of agriculture to employment

Despite the difficulties of estimating in the area of employment with informal jobs, the agricultural sector would occupy in 2012 nearly 60% of the working population: it remains the leading employer. Agriculture in Cameroon creates direct (farmers) and indirect (street vendors of agricultural products) jobs. This sector provides a diversified range of activities, particularly

for women, from food production to marketing, including small processing units. In 1996/97, the DSCN estimated that out of the total employment of 4,188,740 people, 2,483,510 were in agriculture (ie 59.29%). The number of family plantations employing 5 to 6 million Cameroonians is estimated at 1 million (Courade and Ali., 1991). With regard to coffee and cocoa, there would be 620,000 producers who share 110 billion FCFA per year of monetary income (190,000 robusta coffee producers, 168,000 arabica coffee producers, 262,000 cocoa producers).

3.3 Contribution of agriculture to household food

The contribution of agriculture to household food is essentially due to food crops, which not only provide food directly, but also constitute a source of income for rural households, and improve the trade balance by reducing food imports. The main food crops include sweet bananas are mainly plantain, tubers (cassava, potato, yam potatoes and Macabo or taro) and cereals (rice, Mill sorghum and corn) the majority of whose production is self-consumed.

3.4-poverty in Cameroon

3.4.1 - manifestations of poverty

The poverty evoked by the population is manifested by a decline in household purchasing power, an absence of a culture of savings, reduced access to education, an absence or inadequacy of road infrastructure, reduced access to health care, an absence of food security which results in the accentuation of famines, a reduction in the gross domestic product per inhabitant which is manifested by the mismatch between the increase in population and national wealth, etc.….

3.4.2-Agriculture, an important sector in poverty reduction.

In the economic literature, the development of agriculture with a view to reducing poverty has remained at the center of analyses. Thus, for the World Development Report 2008 (WDR 2008), agriculture for development was endorsed by donors and, for the first time since the 1980s, made it possible to renew a broad consensus about the importance of agriculture for development. The WDR 2008 considers agriculture to be essential for overall growth, food security and poverty reduction in countries living mainly from agriculture (which are defined as countries where a high share of growth comes agriculture and where poverty is concentrated in rural areas), most of which are in sub-Saharan Africa. Rapidly rising food prices also pose a significant threat in developing countries, which urgently need international assistance to mitigate the impact on the poor and vulnerable. The effects of agricultural growth on poverty reduction are greatest for the poorest people (Luc Christiaensen and Will Martin; 2018).

4-Literature review

Thirtle, Lin and Piesse (2003) study the effect of increasing total factor productivity on the incidence of poverty in least developed countries (LDCs), measured by the percentage of the population living on less than 1 dollar per day. By means of a regression analysis, their empirical work shows that the increase in agricultural productivity has a strong impact on the reduction of poverty, whereas this is not the case with the increase in productivity in industries and in services. From their empirical observations, the authors show that investment in agricultural research and development has produced significant effects in terms of poverty reduction in Africa and Asia and that, given its considerable profitability, it does not cost anything.

The agricultural development policy conducted in France since the end of the 19th century, of which Crédit Agricole was one of the major instruments, has enabled the agricultural world to join the rest of French society in terms of income, quality of life, and social security, and France to become one of the main exporting powers of agricultural products in the world (Bernard Fouquet, 2014). Much further, the studies carried out in Senegal by Bocar Diagana, Adrien Manko, Cheickh Sadibou Fall and Adama Guèye in 2008 on sustainable agriculture and poverty reduction in the Groundnut Basin of Senegal showed that a good improvement of agricultural projects via the lower fertilizer prices contribute to a reduction of nearly 17% in poverty.

China thus reduced poverty very rapidly, in the 1980s and until the mid-1990s, starting from a situation of fairly equitable access to agricultural land and human capital. On the other hand, in certain regions of Latin America, the links between the increase in agricultural productivity and the reduction of poverty are much less obvious, given the unequal distribution of land and the predominance of agricultural mechanization: agricultural yields have indeed increased rapidly, while rural poverty has hardly diminished. In Viet Nam, total agricultural factor productivity increased rapidly by 3.1% per year between 1991 and 2000, then by 2.4% per year between 2001 and 2009 (K. Fuglie 2012). By the mid-1990s, it was market-driven farming households that benefited the most: the poverty rate for these households fell overall by more than 40% in just five years. Households engaged in subsistence agriculture have also benefited from the situation, their poverty rate having fallen by 28% in five years. In contrast, in the studies on The growth of agriculture and its contribution to reducing poverty, hunger and malnutrition (in the State of Food Insecurity in the World 2012), the authors managed to conclude that as GDP per capita increases, agriculture plays a less important role, both for the economy as a whole and for the poor in particular; it will then be the turn of non-agricultural growth to play a leading role in reducing the poverty of individuals who are certainly poor, but not very poor. On the other hand, for Luc Christiaensen and Will Martin (2018), the poorest are the main beneficiaries of agricultural growth.

5-Materials and method of analysis

5.1 - poverty measurement variable

The importance of this study would be directed towards the use of proxy variables for measuring poverty such as income per individual, improved levels of living conditions of the population through the level of education and health of the population, yet Cervantes-Godoy, D. and J. Dewbre (2010), “Economic importance of agriculture in the fight against poverty”, OECD Publishing, uses the poverty rate as the dependent variable explained by agricultural GDP and non-industrial GDP. agricultural in logarithm. Given the unavailability of data on these variables, we directed the analysis to wealth per individual represented by GDP per capita to quantify the state of poverty.

In order to analyze the contribution of agriculture to the construction of gross domestic product per capita, it was important for us to have in mind a method of analysis to respond effectively to a problem posed. To do this, we must first indicate the variables and their sources of data and units of measurement and then describe and specify the model.

5.2- Sources and statistical description of variable data

5.2.1- Source and unit of measurement of variable data

The sources of the data of the variables having been the subject of our study are among others:

- The World Development Indicator database (WDI, 2020) to have data on gross domestic product per capita, which we calculated from the division of current GDP by the total population;

- The FAO database (FAOSTAT) for data on value added in agriculture in millions of dollars;

- Finally, the data on imports of goods and services on the industrial value including constructions and on gross national savings are also taken from WDI, all expressed in millions of dollars.

The use of the study period from 1980 to 2018, i.e. 39 years, is justified by the availability of data in most databases which are limited to 2018.

5.1.2- Statistical descriptions of variable data

Once the data on the variables have been obtained, it is important for us to carry out the statistical descriptions of the latter. This prompted us to construct Table 4-1 below.

Table 1; Descriptive statistics of variables

	PIBH	VAA	ENB	IBS	VAI
Mean	1030.813	2482.773	3416.510	4133.893	2.50E+09
Median	1009.943	1930.436	2603.661	2537.513	3538.219
Maximum	1540.568	5580.900	7120.700	9716.644	9.97E+09
Minimum	649.9918	158.4338	1465.691	1052.716	1582.180
Std. Dev.	275.5168	1326.143	1647.248	2748.962	3.84E+09
Skewness	0.352157	0.810827	0.826749	0.866446	0.902042
Kurtosis	1.775156	2.592089	2.255501	2.120835	1.911697
Jarque-Bera	3.243989	4.543750	5.343542	6.135752	7.213572
Probability	0.197504	0.103119	0.069130	0.046520	0.027139
Sum	40201.71	96828.16	133243.9	161221.8	9.75E+10
Sum Sq. Dev.	2884561.	66828889	1.03E+08	2.87E+08	5.61E+20
Observations	39	39	39	39	39

Source: Author, estimates made using the Eviews 10 software

In this table, the Skewnesses of all the variables are positive and not close to zero except for the annual temperature. We will then say that the distributions of these variables are symmetrical with respect to their mean. The probability masses are thus concentrated on the

lower and upper parts of their mean. That is to say that over the 39 years observed, the probability of falling on a year where the observations of all the variables of studies are lower than their average are equitably distributed than their complement. The Kurtosis are also positive and greater than 1, we deduce that the variations are more flattened than that of a normal law (which is justified only by the non-significance of the Jarque-Bera test at the 5% threshold for the variables import of goods and services (IGS) and the industrial value added (IVA) whose probability of significance is less than 0.05) for all the variables and that we observe large deviations from the average, which suspects the non-stationary state of the time series. This is how we will have to do the stationarity test in the following after having specified the method of analysis.

5.2-Specification of the data analysis method

In order to determine the contribution of agriculture to poverty reduction in Cameroon via the determination of the share of agricultural value added (AVA) in the construction of GDP per capita (GDP/CAP), we will use a model econometric and statistical precisely the multiple linear regression model estimated by the method of ordinary least squares (OLS) allowing to statistically deduce these contributions accompanied by other control variables. In general, this model will have the following structure: on the left we will have the explained variable GDP/CAP_t which represents the gross domestic product per capita measuring the state of poverty in Cameroon during the period t; on the right we will have the main study explanatory variables (or variables of interest): AVA_t and representing the agricultural value added during period t and the explanatory control variables: GNS_t, IGS_t and IVA_t representing gross national savings respectively, imports of goods and services and industrial value added include construction during period t.

The model to be estimated is represented in specific form as follows:

$GDP/CP_t=\omega_0+ \omega_1 AVA_t+ \omega_2 GNS_t + \omega 3 IGS_t + \omega_4 AVA_t + \varepsilon_t$;

With t= (1980, 1981, 1982, ……, 2018) and ε_t is white noise.

6- Results: statistical and econometric discussions

Before moving on to the presentation of the results via the estimation of the model, it remains important to initially perform various tests serving the analyzes of the time series of the different variables.

6.1-Usual description test: Augmented Dickey-Fuller stationarity test and Granger causality test

6.1.1- Augmented Dickey-Fuller stationarity test

The parameters of the multiple regression model can only be estimated by OLS on stationary time series, for this we first need to perform the Augmented Dickey-Fuller stationarity test on our model variables.

Table 2: Dickey-Fuller stationarity test Augmented with model variables

Variables	A niveau	Différence première
PIB/CP	0.714272**	-6.741695
AVA	1.360591**	-7.506154
GNS	1.719226***	-7.150418
IGS	0.860622**	-1.99906
IVA	-1.588003	-4.949729

Source: Authors, estimates made using the Eviews 10 software (*** and ** correspond respectively to significance at 1% and 5%

In light of DFA test all variables are not stationary at level. We will make them stationary by making the first difference. Thus, they are integrated of order 1 all the variables, in our model to be estimated, they will take DS at the end to signal that the variables are made stationary by making the first differences. Before performing the actual estimation of the model, it is necessary to first perform the Granger causality test between each explanatory variable and the explained variable.

6-1-2- Granger causality test

Table 3: Estimation of granger causality test on variables

Null Hypothesis:	Obs	F-Statistic	Prob.
AVADS does not Granger Cause GDP/CAPDS	36	1.22555	0.3074
GDP/CAPDS does not Granger Cause AVADS		4.48199	0.0195
GNSDS does not Granger Cause GDP/CAPDS	36	1.52771	0.2329
GDP/CAPDS does not Granger Cause GNSDS		0.24392	0.7850
IGSDS does not Granger Cause GDP/CAPDS	36	1.76450	0.1880
GDP/CAPDS does not Granger Cause IGSDS		0.01928	0.9809
IVADS does not Granger Cause GDP/CAPDS	36	1.18426	0.3194
GDP/CAPDS does not Granger Cause IVADS		0.01472	0.9854

Source: Authors, estimates made using Eviews 10 software

The Granger causality test indicates that the variable Agricultural value added, gross national savings and Industrial value added significantly influence GDP per capita at the 5% threshold. But these influence relationships can be negative or positive, which are confirmed by the signs of the correlation coefficients listed in Table 5-1 below. To really corroborate these influence relationships, we will present the correlation relationships between the variables before reviewing the actual estimation of the model.

6.2- Presentation of the relationships between the study variables

Before performing the actual estimation of our model, it is first of all our duty to visualize the existing correlations between the variables in order to confirm the degrees of dependence between the explained variable of each explanatory variable and the degrees of independence between the explanatory variables.

Table 4: Correlation coefficient of variables

	Gdp/cApDS	AVADS	GNSDS	IGSDS	IVADS
GDP/CAPDS	1	0.5051	0.7592	-0.1179	0.3279
AVADS	0.5051	1	0.2760	-0.07423	0.2418
GNSDS	0.7592	0.2760	1	-0.2647	0.4224
IGSDS	-0.1179	-0.07423	-0.2647	1	-0.0155
AVADS	0.3279	0.2418	0.4224	-0.0155	1

Source: Author, estimate by Eviews 10

By observing Table 5-1 below, we find that gross domestic product per capita is positively correlated with value added in agriculture, gross national savings and weakly with industrial value added as well as weakly and negatively with imports of goods and services. This means that an increase in agricultural value added, gross national savings and industrial value added induces an increase in GDP per capita. On the other hand, the negative correlation between GDP per capita and imports of goods and services means that an increase in the latter causes a priori a deterioration in GDP per capita.

With regard to the correlations between the explanatory variables, the table shows that agricultural value added, gross national savings, imports of goods and services and industrial value added are all weakly correlated with each other. The correlation coefficients between agricultural added values, gross national savings, imports of goods and services and industrial added values are respectively: 0.27, -0.07 and 0.24. Between gross national savings, imports of goods and services and industrial added values, these coefficients are respectively -0.26 and 0.42. The existence of these weak correlations between the explanatory variables makes it possible to validate our multiple regression modeling including the OLS estimation method which will require the stationarity of the time series of the variables by passing through the stationarity test of the variables presented above.

6.3- Model estimation and interpretation

Before moving on to the interpretations and discussions of the results, it is wise to estimate the parameters of the model as well as any tests to validate the authenticity of this estimate, namely the heterocedasticity test to check whether the errors of estimation are correlated or not with the explanatory variables and the error correlation test to see if these errors are correlated with each other.

6.3.1- Estimation of the study model

Table 5: Model estimation and presentation of results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.87188	14.01076	-0.990088	0.3293
AVADS	0.059438	0.030719	1.934914	0.0416
GNSDS	0.185071	0.031224	5.927130	0.0000
IGSDS	0.005755	0.006857	0.839262	0.4074
IVADS	-3.85E-09	1.31E-08	-0.295275	0.7696
R-squared	0.626099	Mean dependent var		19.78630
Adjusted R-squared	0.580777	S.D. dependent var		124.1463
S.E. of regression	80.38153	Akaike info criterion		11.73353
Sum squared resid	213219.3	Schwarz criterion		11.94900
Log likelihood	-217.9370	Hannan-Quinn criter.		11.81019
F-statistic	13.81464	Durbin-Watson stat		2.223607
Prob(F-statistic)	0.000001			

Source: Authors, estimates made using Eviews 10 software

After the estimation of our model in which per capita GDP is expressed as a function of agricultural added values and other variables, the model proves to be globally significant at 63% with a Fisher significance at the 5% level whose probability is 0.000001 well below 0.05. To confirm the validity of the model estimate and effectively interpret the results, it is important to perform the Breusch-Pagan-Godfrey heterocedasticity test and the Breusch-Godfrey error correlation test in turn. At the end of these tests, it emerges that the errors are globally heterocedastic with respect to each explanatory variable of the estimated model (see table 2 in the appendix) and these estimation errors are also globally uncorrelated whose test de Breusch-Godfrey reveals this in table 3 of the appendix.

6.3.2- Interpretation and discussion of results

At the end of the estimate contained in table 5 above, the results show that the gross domestic product per capita is positively and significantly influenced at the 10% threshold by the agricultural value added with an associated parameter of 0.059483 dollars. This would mean that with a risk of being wrong by 10%, when the added value in agriculture increases by one-million-dollar unit, the wealth per individual in the global sense increases by 5.9483%. In other words, the amount of increase in agricultural added value allows the valuation of GDP

per capita to be substantially 6%. Agriculture therefore remains an important sector in the improvement of individual wealth through the development of the products produced there. This result is partially aligned with the analysis made by Kuznets (1946) who considers that the contribution of agriculture to development is made through three essential channels whose importance varies according to the economic and social structure of the country: its production with share in GDP growth, market by buy and sell in domestic non-agricultural sectors, and factors by buy and sell in foreign sectors. Further still, Cleaver (1993) reinforces the idea that agriculture has an overall knock-on effect on all the other sectors by supporting the consideration of the multiplier effect, estimating that a growth rate of 1% of the agricultural sector would cause a growth of 1.5% for the national economy by stimulating the sectors of transport, industries and services. Cameroon is no exception to this rule, it benefits from considerable contributions from the agricultural sector. On the other hand, in this study, this multiplier effect is not expressed in terms of stimulation of the national economy, but essentially targets individual wealth since the 1% growth in agricultural value added implies a 0.06% growth in GDP per inhabitant. This implies that a one-million-dollar increase in agricultural value added leads to a $600 increase in per capita GDP.

Apart from the agricultural value added which significantly influences the GDP per capita, gross national savings has a positive effect whose increase of one-million-dollar unit induces an increase in individual wealth of 185,071 dollars. This would confirm that national savings is a crucial indicator in the construction of improvement of the living conditions of the national population. It is important for Cameroonians to intensify their savings in order to build their individual income. Although the agricultural value added and the gross national savings are significant in our model estimated at the threshold of 10% and 5%, it turns out that the imports of goods and the industrial value added are not. But it should still be noted that imports of goods and services influence very weakly and positively the gross domestic product which is also negatively influenced by the industrial value added. These observations confirm the study by Thirtle, Lin and Piesse (2003) based on regression analyses, indicating that the increase in agricultural productivity has a strong effect on poverty reduction, whereas this is not the case productivity growth in industry and services.

7-Conclusion and recommendations

The study on agriculture and poverty reduction in Cameroon prompted us to determine the relationship between the growth of GDP per capita (GDP/CAP) and the added value of agriculture (AVA). Other variables such as industrial value added (IVA), gross national savings (GNS) and imports of goods and services (IGS) are also used in our analysis model. The data on these variables come from the FAOSTAT and World Bank database (WDI, 2020) ranging from 1980 to 2018. Data analyzes are carried out on the basis of ordinary least squares methods, including the regression model multiple in which GDP per capita is expressed as a function of agricultural value added and other explanatory control variables.

At the end of these analyses, the results showed that at the 10% threshold, agricultural value added and gross national savings positively influence GDP per capita. Thus, the role played by agriculture in poverty reduction will depend on the specific conditions under which the products produced there are processed. Therefore, the government must support and strengthen this role in various ways through giving small farmers better opportunities to participate in the sustainable development of agriculture and rural areas. Recall, however, that as per capita GDP increases, agriculture will play an important role, both for the economy as a

whole and for the poor, so that non-agricultural growth plays an important driving role in reducing poverty. the poverty of individuals who are certainly miserable.

The Government of Cameroon must make structural transformation effective and take rapid measures, in particular through investments in infrastructure and training, to ensure that the rural poor are able to participate in this process of transformation of agricultural products and take advantage of emerging opportunities for gainful employment. Inclusive agricultural development strategies should be initiated by national authorities to improve productivity and sustainability, while paying due attention to the role of smallholders and the rural poor in the transformation process. It is also necessary to formalize the agricultural sector, that is to say, to integrate agriculture into the formal sector of the national economy and to strengthen the infrastructure of the processing industries and the marketing of agricultural products.

Bibliographic references

Bernard Fouquet. 2010. Study on the financing of agriculture and the rural world.Main report Mali 2010.PP 1- 9.

Bocar Diagana, Adrien Mankor, Cheickh Sadibou Fall and Adama Guèye. 2008. Sustainable agriculture and poverty reduction in the Groundnut Basin from Senegal: Results of the Tradeoff Analysis Model. ISRA - reflexions and perspectives Vol.6; N°5 PP 1- 44.

Cervantes-Godoy, D. and Dewbre, J. 2010. Economic importance of agriculture in the fight against poverty, OECD Publishing, PP 2-7.

Cleaver K. 1993. Is there a synergy between population growth, agricultural development and the environment in sub-Saharan Africa? in Chasteland J.-C., Véron J. and Barbieri M. (eds.), Development policies and rapid demographic growth, Congresses and conferences no. 13, Paris, Ined-Ceped.

Franck Galtier. 2012. Recent price developments agricultural raw materials to manage the instability of food prices. Different solutions for the North, for the South and for the markets international. 2012/3 n°211. PP 51 -70.

Johnston, Bruce and Mellor John W.1961. The role of agriculture in economic development. American Economic Review 51:566-93.

Keith Fuglie and Sun Ling Wang .2012. Productivity Growth in Global Agriculture Shifting to Developing Countries. The magazine of food, farm, and resource issues 4rd Quarter 2012 • 27(4) ; JEL Classification: Q16, O47. PP 1-7.

-Kuznet, S. 1946. National income: A summary of findings; Publisher: NBER; ISBN: 0-87014-113-9. Introduction. PP1-2.

- Luc Christiaensen and Will Martin.2018. New studies on the role of agriculture in poverty reduction: five key takeaways; https://blogs.worldbank.org/fr/voices/nouvelles-tudes-sur-le-role-de-l-agriculture-dans-la-reduction-de-la-pauvrete.

- **MINADER .2001.** https://reliefweb.int/sites/reliefweb.int/files/resources/wfp083127.PP 1-54.

-**Mounier, A. 1992.** Economic theories of agricultural growth. Versailles, INRA, economica. Rural studies, Littaraoux in perspective. PP 133-134.

-Samuelson. A.1995. The main currents of economic thought: basic concepts and questions essentials, fourth revised and expanded edition. PUG, 1995.

Schrieder. G. 1996. SCHRIEDER G. The role of rural finance for food security of the poor in Cameroon. PhD Thesis, Frankfurt, Germany, Peter Lang Verlag, 1996.

Staatz John and Niama Nango Dembele. 2007. Agriculture for Development in Sub-Saharan Africa. Documents of reference prepared for the World Development Report world 2008.

Theodore Schultz .1979. The Economics of Being Poor ; Lecture to the memory of Alfred Nobel, December 8, 1979.

Thierry Pouch (2008). Boiling Agricultural Markets: Diagnosis and Risk Assessment for the Global Economy. Choiseul Editions "Geoeconomics" 2008 /3 (n° 46) , pp 35-60.

Thirtle, C. Lin, L. and Piesse, J. 2003. The Impact of research Led Agricultural Productivity Growth on Poverty Reduction in Africa, Asia and Latin America**.** *World Development*, 2003, vol. 31, issue 12, 1959-1975.

Wampfler B (1998): Diagnosis of demand and supply for rural finance in the Gaya-Niger area. CIRAD/TERA study report, n0 21/98. PP 1-15.

Wampfler B (1996): Study of the strategies of rural households, their activities and the place of credit ADF (Albanian Development Fund), CIRADSAR study report, n0 101/96. PP 4-10.

World Bank. 2008. The World Bank Annual Report 2008 : Year in Review. Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/7524 License: CC BY 3.0 IGO.

World Bank. 2005. The World Bank Annual Report 2005 : Year in Review, Volume 1. Washington, DC. © World Bank. https://openknowledge.worldbank.org/handle/10986/7537 License: CC BY 3.0 IGO.

Appendices

Table 1: Model estimation

Dependent Variable: GDP/CAPDS				
Method: Least Squares				
Date: 03/08/22 Time: 16:29				
Sample (adjusted): 2 39				
Included observations: 38 after adjustments				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-13.87188	14.01076	-0.990088	0.3293
AVADS	0.059438	0.030719	1.934914	0.0416
GNSDS	0.185071	0.031224	5.927130	0.0000
IGSDS	0.005755	0.006857	0.839262	0.4074
IVADS	-3.85E-09	1.31E-08	-0.295275	0.7696
R-squared	0.626099	Mean dependent var		19.78630
Adjusted R-squared	0.580777	S.D. dependent var		124.1463
S.E. of regression	80.38153	Akaike info criterion		11.73353
Sum squared resid	213219.3	Schwarz criterion		11.94900
Log likelihood	-217.9370	Hannan-Quinn criter.		11.81019
F-statistic	13.81464	Durbin-Watson stat		2.223607
Prob(F-statistic)	0.000001			

Source: Author, estimated by Eviews

Table 2: estimate of heterocedasticity tes

Heteroskedasticity Test: Breusch-Pagan-Godfrey

F-statistic	0.481316	Prob. F(4,33)	0.7492
Obs*R-squared	2.094762	Prob. Chi-Square(4)	0.7183
Scaled explained SS	3.850722	Prob. Chi-Square(4)	0.4266

Test Equation:

Dependent Variable: RESID^2

Method: Least Squares

Date: 03/10/22 Time: 07:03

Sample: 2 39

Included observations: 38

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6520.638	2252.468	2.894886	0.0067
AVADS	-5.782967	4.938591	-1.170975	0.2500
GNSDS	-1.515289	5.019847	-0.301860	0.7647
IGSDS	-0.396651	1.102395	-0.359808	0.7213
IVADS	-8.44E-08	2.10E-06	-0.040205	0.9682

R-squared	0.055125	Mean dependent var	5611.034
Adjusted R-squared	-0.059405	S.D. dependent var	12555.16
S.E. of regression	12922.70	Akaike info criterion	21.89344
Sum squared resid	5.51E+09	Schwarz criterion	22.10891
Log likelihood	-410.9753	Hannan-Quinn criter.	21.97010
F-statistic	0.481316	Durbin-Watson stat	1.991594
Prob(F-statistic)	0.749220		

Source : Author, estimated by Eviews

Table 3: error correlation test

Breusch-Godfrey Serial Correlation LM Test:			
F-statistic	0.450771	Prob. F(2,31)	0.6412
Obs*R-squared	1.073886	Prob. Chi-Square(2)	0.5845

Test Equation:

Dependent Variable: RESID

Method: Least Squares

Date: 03/10/22 Time: 07:09

Sample: 2 39

Included observations: 38

Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.957556	14.40058	0.066494	0.9474
AVADS	-0.007903	0.035130	-0.224953	0.8235
GNSDS	0.000864	0.031865	0.027110	0.9785
IGSDS	-0.000253	0.007044	-0.035948	0.9716
IVADS	2.30E-10	1.34E-08	0.017180	0.9864
RESID(-1)	-0.147544	0.179283	-0.822969	0.4168
RESID(-2)	-0.117270	0.206499	-0.567897	0.5742

R-squared	0.028260	Mean dependent var	5.87E-15
Adjusted R-squared	-0.159819	S.D. dependent var	75.91234
S.E. of regression	81.75370	Akaike info criterion	11.81012
Sum squared resid	207193.7	Schwarz criterion	12.11178

Log likelihood	-217.3923	Hannan-Quinn criter.	11.91745
F-statistic	0.150257	Durbin-Watson stat	1.982724
Prob(F-statistic)	0.987621		

Source : Author, estimated by Eviews