Agriculture Share of the Gross Domestic Product and its Implications for Rural Development

Anyanwu Sixtus O[1*], Ibekwe U.C.[2], Adesope Olufemi M[3].

1. Department of Agricultural Economics, Rivers State University of Education, Port Harcourt, Nigeria
2. Department of Agricultural Economics, Federal University of Technology Owerri, Nigeria
3. Department of Agricultural Economics and Extension, University of Port Harcourt, Nigeria
sixtusanyanwu@yahoo.com

Abstract: The study considered the relationship between Gross Domestic Product and output of major stapled food crops of Nigeria between 1990 and 2001. Data used were collected from various issues of Central Bank of Nigeria Statistical Bulletin, Annual Reports and Bureau of Statistics. Using correlation matrix, the result showed that there is a strong, positive and statistically significant relationship between GDP and these food crops except for wheat. Policies should therefore be put in place by the appropriate authorities geared towards providing production incentives to the rural farmers to enable them produce more of these stapled food crops that have significant impact on the GDP of Nigeria. [Report and Opinion 2010;2(8):26-31]. (ISSN: 1553-9873).

Key words: Gross Domestic Product; Rural Development

1. Introduction

With an estimated population of 140 million people (NPC,2007), growing at the rate of 3.65%, per year, it means that by the year 2020 the nation's population will be about 201, 320000 million people (an addition of about 61.32 million people in 12 years). If the current food production growth trend of 1.35%, annually is not increased to tally with or surpass the population growth rate, then the country will be in for a turbulent future (Oparaeke, et al 2009). At independence in 1960, Nigeria and some South East Asian countries stood at par socio-economically. Over the past 30 years, the South East Asian countries (Malaysia, Indonesia, and others), invested 10%, to 20% of their annual capital budgets into agriculture leading to massive economic transformation of their countries (Ndubuizu, 2003).

Table 1: Budgetary Allocation to Agriculture (N' Billion)

Year	Agric. GDP (N Million)	Total Capital Expenditure (N Million)	Total Capital Expenditure Agric.	Capital Expenditure Agric. (% of total)	FAO Stipulation (%)
1990	35.8	24.05	1.60	6.65	25
1991	36.5	28.34	1.22	4.30	25
1992	37.3	39.76	0.94	2.37	25
1993	37.38	54.50	1.82	3.35	25
1994	38.6	70.92	2.18	3.07	25
1995	40.0	121.14	2.41	1.99	25
1996	41.7	158.68	3.89	2.45	25
1997	43.5	269.65	6.25	2.32	25
1998	45.25	309.00	4.33	1.40	25
1999	47.6	498.00	8.88	1.78	25
2000	48.99	239.50	6.91	2.89	25
2001	51.47	438.70	5.76	1.31	25

Source: CBN Annual Report and Federal Office of Statistics

Table 1 shows that between 1990 and 2001, while total capital expenditure was increasing, total capital expenditure on agriculture was decreasing or stagnant. The total capital expenditure allocated to agriculture as a percentage of the total allocation to capital expenditure in the national budget ranged from 1.31% in 2001 to 6.65% in 1990. Generally, budgetary allocations by governments to different ministries should be a reflection of the priority they accord to these ministries. The highest total capital expenditure allocation made to the agricultural sector during this period under review was in 1990

– during the period of the Structural Adjustment Programme (SAP). Prior to this period, the relative share of the agricultural sector in the National Gross Domestic Product (GDP), declined from 62% in the 1960s to 47.9% in the 1970s, down to a low 19% in 1980's, but following the SAP, this share was turned around in the 1990's rising steadily to 38% in 1994, 39.2% in 1997 and 41.3% in 1990 (Ndubuizu, 2003). This shows that, capital budgetary allocations to the agricultural sector are positively related to the National Gross Domestic Product. In other words, increase in governmental expenditure in the agricultural sector will translate into increased GDP. Such expenditure may be in form of supply of improved planting materials or fertilizer, machineries, or credit facilities to boost agricultural production. This implies that adherence to the FAO stipulated 25% budgetary allocation to agriculture holds the key to real agricultural development in Nigeria as it will make the agricultural sector to regain its lost position in the National GDP. This explains why the current study is examining the relationship between some selected major food staples and the agricultural GDP. This will enable us to isolate those that had significant positive impact on the GDP; sharpen policy geared towards increased food production and increased agricultural GDP in general. The Gross Domestic Product (GDP), is a basic measure

of a country's economic performance, and is the market value of all final goods and services made within the borders of a nation in a year. It is a fundamental measurement of production and is very often positively correlated with the standard of living (Sullivan, et al 1996).GDP can be defined in three ways, all of which are conceptually identical. First, it is equal to the total expenditures for all final goods and services produced within the country in a stipulated period of time (usually a 365-day year). Secondly, it is equal to the sum of the value added at every stage of production (the intermediate stages) by all the industries within a country, plus taxes less subsidies on products, in the period. The third definition equates it to the sum of the income generated by production in the country in the period—that is, compensation of employees, taxes on production and imports less subsidies, and gross operating surplus (or profits) (Wikipedia, 2009). GDP can be classified as current, nominal or real. Current GDP is GDP expressed in the current prices of the period being measured while nominal GDP is the production of goods and services valued at current prices. Real GDP on the other hand is the production of goods and services valued at a constant price level (i.e.: not affected by changes in the value of money)
The most common approach to measuring and quantifying GDP is the expenditure method:

GDP = C + I + G + (X − M).
Where GDP = Gross Domestic Product
       C = private consumption
       I = gross investment
       G = Government spending
       (X-M) = Export - Import

The GDP of a country is one of the primary indicators used to gauge or measure the health of that country's economy. Since it is positively correlated with the standard of living, it can be used to positively affect the lives of rural dwellers. It represents the total dollar value of all goods and services produced over a specific time period. It can be seen as the size of the economy. GDP is expressed as a comparison to the previous quarter or year. For instance if the year-to year GDP is up 5%, this implies that the economy has grown by 5% over the last year.

Current GDP per capita of Nigeria expanded 132% in the sixties reaching a peak growth of 283% in the seventies. But this later shrank by 66% in the eighties. In the nineties, diversification initiatives finally resulted in the restoration of a decadal growth of 10%. In 2005, the GDP was composed of the following sectors:

agriculture, 26%, industry, 48.8% and services, 24.4% (CGDP, 2007).

Agriculture has suffered from years of mismanagement, inconsistent and poorly conceived government policies, and the lack of basic infrastructure. Still, the sector accounts for over 26.8% of GDP (CGDP, 2007) and two thirds of employment. Food crops constitute the largest component of the crops sub sector of Nigeria's agricultural sector (CBN, 2003). They are classified broadly into cereals, pulses, roots, tubers, and plantain, oil seeds, and nuts, vegetables and fruits, sugar and beverages.

1.1 Root and Tuber Crops

Roots and tuber crops are major sources of dietary carbohydrates and provide food for over 60 millions people in Nigerian (Abubakar, 2003). Cassava is Africa's second most important food

staple, after maize, in terms of calories consumed. It is a major source of calories for roughly two out of every five Africans. It is consumed daily and sometimes more than once a day (Dostie et al 1999, Haggblade, 2003). Cassava growing belts fall within four agro ecological zones South East, South West, South- South, and Central states. The first three zones are within the humid tropics, with soil types that are rich in plant nutrients. Cassava production has potential to create employment opportunities for the unemployed labour force in the rural areas both in its cultivation, processing and marketing. Nigeria is the largest producer of cassava in the world. About 31.8 million tonnes are produced annually with internal demand put at about 48 million tonnes. Russia and the rest of Europe have now turned to Nigeria the acclaimed number one producer of cassava in the world following the inability of Thailand to sustain supplies of cassava chips (Ndubuizu, 2003).

Yam (Dioscorea, spp), on the other hand is a major tuber staple in West and Central Africa where it provides food for over 160 million people (Nweke, et al 1991, Okwor, 1995). The West African yam Belt produced 95% of the world output of 34million metric tonnes of yam in 2001 and Nigeria alone produced 75% of the West African output (FAO,2002). On the basis of quantity of root and tuber crops produced in Nigeria, yam ranks second only after cassava but in global production yam ranks fourth after potatoes, cassava and sweet potatoes (Ikeorgu, 2003). Growth in area cropped however represents 75% of the growth in production (Lev and Shriver, 1997).

1.2 Cereal Crops

National production (in 2002) of rice is put at 2.96 million metric tonnes with annual demand

of 4.2 million tonnes. Rice demand grows at an annual rate of 6% because rice is no longer luxury food item but a staple (Ndubuizu, 2003). The target date for self sufficiency or at least self reliance in respect of most food crops was set at 1992. It was expected that the target output set for various food crops would provide each Nigerian with at least 2100 calories and 60 grammes of protein per day. To achieve the stated policy targets, commodities such as legumes, tubers and fruits were expected to record annual growth rates of about 5% or more. Also millet, sorghum, cassava and leafy vegetables were expected to record output growth rates 6 – 8 percent while maize, rice, wheat, soya bean and sugarcane were expected to grow by over 10 percent annually (CBN, 2003). Policy measures targeted at reaching, assisting and alleviating the problems of the small holder farmers in the rural areas by the government will not only increase the national GDP, but also increase the farmers' standard of living and lead to rural development.

2. Materials and methods

The data used in this study are outputs of major stapled foods (in tones) compiled from various issues of Central Bank of Nigeria Statistical Bulletins. The period covered is from 1990 to 2001. The agricultural GDP is derived from Central Bank of Nigeria Annual Report and Federal Office of Statistics (Table 1). To examine the relationship between the agricultural Gross Domestic Product and outputs of major stapled foods, correlation matrix was used. The agricultural GDP is the dependent variable while the outputs of major stapled foods of Nigerians are the explanatory variables. The model estimated is specified as:

$Q = f(X_1, X_2 \ldots, X_{13})$
Where
Q_i (i = 1, 2 …13) = Agricultural Gross Domestic Product per year (NMillion)
X_1 = output of Acha (000, tonnes)
X_2 = output of Beans (000, tonnes)
X_3 = ,,   ,, Cassava (000, tonnes)
X_4 = ,,   ,, Cocoyam (000, tonnes)
X_5 = ,,   ,, Maize (000, tonnes)
X_6 = ,,   ,, Millet (000, tonnes)
X_7 = ,,   ,, Plantain (000, tonnes)
X_8 = ,,   ,, Potato (000, tonnes)
X_9 = ,,   ,, Rice (000, tonnes)
X_{10} = ,,   ,, Sorghum (000, tonnes)
X_{11} = ,,   ,, Vegetable (000, tonnes)
X_{12} = ,,   ,, Wheat (000, tonnes)
X_{13} = ,,   ,, Yams (000, tonnes)

3. Results and Discussions

Results of data analysis are presented in Table 2. The table shows that there is a strong positive correlation between the root crops such as cassava, cocoyam, yams, and potato. This implies that increase in the output of these crops will lead to increase in the GDP. While the correlation between GDP and yams, cocoyam and potato is statistically significant at 1percent that of cassava is statistically significant at 5percent. This means that these root crops are statistically significant determinants of the GDP in Nigeria. In other words increase in the output of cassava, yam, cocoyam, and potato will significantly increase the GDP of Nigeria. The results further showed that there is a positive correlation between GDP and the output of acha, maize, millet, rice, and sorghum. This implies that increase in the output of these crops will lead to increase in the GDP of Nigeria all things being equal. However, there is a negative correlation between the output of wheat and GDP. This result was not expected. The reason for the result may be because resources used in the production of wheat may have been used to the point of diminishing returns to scale. While the correlation between GDP and maize is weak and not statistically significant at 5percent those of acha, millet, rice, and sorghum are strong and statistically significant at 1percent. This means that among the cereal crops, acha, millet, rice and sorghum are the main determinants of the GDP in Nigeria within the period under review. Table 2 also shows that there is a strong positive correlation between GDP and the output of beans, plantain, and vegetable. In other words increase in the output of beans, plantain and vegetable will significantly increase the GDP of Nigeria.

4. Implications for Rural Development

Development implies change. The goal of all forms of development; be it agricultural or otherwise, is the material and non-material betterment of the family – the basic unit of society. It is when these changes brings about the betterment of the household that it can be considered as development.

Agriculture is the largest non oil export earner and largest employer of labour accounting for 88% of the non oil foreign exchange earnings and 70% of the active labour force of the population (FGN, 2001). The smallholder farmers that produce most of these crops are resident in the rural areas with little or no capital base for investment in farming activities. Equity demands that these rural dwellers who toil in the villages be encouraged with production incentives such as soft loans to enable them produce more of these stapled food crops that significantly increased the GDP. In addition rural roads should be constructed to evacuate these produce. Since GDP is positively correlated with standard of living, it then implies that policies aimed at improving the GDP of the nation must necessarily be synonymous with improving the standard of living of the farmers. It is only when development policy is targeted at majority of the rural dwellers (in our case the farmers that constitute about 90 percent), that the needed change in the households or rural areas and indeed rural development must have taken place. If otherwise, rural developments will not only be a utopia but a surrealistic hope.

5. **Conclusion**

The study examined the relationship between Gross Domestic Product of Nigeria and the output of some major stapled food crops between 1990 and 2001. Data used were collected from various issues of Central Bank of Nigeria Statistical Bulletin, Annual Reports, and Federal Office of Statistics.

Correlation matrix was used to determine the relationship between GDP and the output of acha, maize, beans, cassava, cocoyam, millet, plantain, potato, rice, sorghum, vegetable, wheat, and yams. The results showed that with the exception of wheat there is a strong positive and significant correlation between GDP and output of these crops within the period under review. Therefore, rural development can only be meaningful when the small holder farmers in the rural areas are empowered to produce more. This will further diversify the Nigerian economy which currently is heavily dependent on the proceeds from crude oil.

Correspondence to:
Dr Anyanwu Sixtus O
Department of Agricultural Economics and Extension,
University of Port Harcourt, Nigeria
Email: sixtusanyanwu@yahoo.com

Pearson Correlation	GDP	X1	X2	X3	X4	X5	X6	X7	X8	X9	X10	X11	X12	X13
GDP	1.00													
Acha	.97**	1.00												
Beans	.98**	.98**	1.00											
Cassava	.67*	.76**	.73**	1.00										
Cocoyam	.96**	.99**	.98**	.79**	1.00									
Maize	.13	.28	.19	.241	.28	1.00								
Millet	.83**	.78**	.83**	.581*	.79**	-.21	1.00							
Plantain	.93**	.96**	.95**	.83**	.98**	.32	.75**	1.00						
Potato	.94**	.98**	.96**	.83**	.99**	.34	.76**	.98**	1.00					
Rice	.82**	.75**	.79**	.64**	.76**	-.12	.68*	.73**	.74**	1.00				
Sorghum	.95**	.99**	.97**	.80**	.99**	.26	.76**	.96**	.98**	.81**	1.00			
Vegetable	.97**	.98**	.97**	.75**	.99**	.18	.80**	.95**	.96**	.75**	.97**	1.00		
Wheat	-.60*	-.94**	-.69*	-.70*	.77**	-.42	-.46	-.79**	-.79**	-.32	.72**	-.69*	1.00	
Yams	.86**	.74**	.89**	.84**	.96**	.60*	.66*	.95**	.97**	.67*	.95**	.92**	-.86**	1.

Source. Computer print out.

References

[1] National Population Commission (NPC) (2007). National Economic Census Board, 2006, Abuja, Nigeria

[2] Oparaeke, A.M. (2009)"Global Food Crisis and its Implication in Nigeria" M. U. Iloeje, C.C. Asiabaka, J.C. Obiefuna, G.E. Osuji, A. B.I. Udedibie, J.S. Orebiyi, M.C. Ofoh, B.O.Esonu, G.E. Nwandikom, N.J. Okeudo and E. B. Etuk (eds), Proceedings of the International Conference on Global Food Crisis Federal University of Technology, Owerri, Nigeria, April, 19th – 24th pp 304 – 307

[3] Ndubuizu, T.O.C (2003) "The Role of the Private Sector in Agricultural Development in Nigeria" Paper Presented at the 43rd Annual General Meeting and Conference of The NACCIMA, Aug. 20th – 21st Grand Hotel Asaba, Delta State.

[4] Sullivan, A. and S.M. Sheffrin (1996). Economics: Principles in Action http: //www. Pearsonschool. Com/index.cfm

[5] Wikipedia (2009) "Users Guide: Background Information on GDP and GDP Deflator, Measuring the Economy: Primer on GDP, and the National Income and ProductAccounts (http://www.bea.gov/national/pdf/nipa primer pdf) Bureau of Economic Analysis.

[6] Center for Global Development: (2007) Publications: Resolving Nigeria's Debt through a Discounted Payback.

[7] Central Bank of Nigeria (2003) Contemporary Economic Policy Issues in Nigeria. In Nnanna, O.J., Alade, S.O and Odoko, F. O. (eds). Kas Arts Services, Nigeria

[8] Abubakar, A. (2003) "Employment Creation and Opportunities in the Agro-Allied Sub-Sector: The Case of Cassava Production" Bullion, 27 (4), 1-10

[9] Dostie, B., L. Rabenasola, and J. Randriamammonjy (1999) "La Filiere manioc: amortisseur oublie de vulnera oles, Anta anarivo, Institut National de la Statistique.

[10] Haggblade, Steven and Zulu Ballard (2003) "Conservation Farming in Zambia" EPTD, Discussion paoper No. 108. Washington, D.C.; International Food Policy Research Institute.

[11] Nweke, F.I., B.O. Ugwu, C.L.A. Asadu and P.Ay (1991) Production costs in yam based cropping systems in South Eastern Nigeria. RCMP Research monograph, No. 6, IITA, Ibadan, Nigeria.

[12] Okwor, G.C., O.O. Okoli, J.K..U. Emehute and N.o. ezeh (1995) Optimum plant population density, depth of planting and best tuber portion of mother seed yam as sett in seed yam production using minisett technique. NCRCR annual report, Umudike, Umuahia, Nigeria

[13] Food and Agricultural Organisation (FAO) (2002) Production Year Book for 2001, FAO, Rome, Italy.

[14] Ikeorgu, J.E.G. (2003) "Creating Employment Opportunities in the Agro-Allied Sub Sector" Bullion Publication of Central Bank of Nigeria, Vol.27 No. 4, pp 15 – 22.

[15] Lev, L.S. and A.L. Shriver (1997) "A Trend Analysis of Yam Production, Area, Yield and Trade(1961-1996), in Berthaud J, N.Bricas and Morchand J.L(eds) L'igname Plante seculaireet culture d' avente Actes du seminaire Internationale

Montpelier France.

Agricultural Policy, Ministry of Agriculture, Natural
Resources and Rural Development Lagos.

8/1/2010