

NIGERIAN WOMEN, MACROECONOMIC ENVIRONMENT AND AGRICULTURAL OUTPUT

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The attainment of the Millennium Development Goals (MDGs) by 2015 will depend on policies that are made and how these policies affects agriculture in particular and women farmers generally. This study assesses the impact of macroeconomic environment on the staple food production efforts of women in Nigerian agriculture. Specifically, the study describes the trend in the outputs of cassava, yam and rice vis-à-vis the selected macroeconomic policy variables in the country and analyzes the effects of the selected macroeconomic policy variables on the output of these staple food crops. The results confirm that policies that enhance the capital base of the women if supported by technology friendly packages will encourage production, reduce poverty and therefore be invaluable in enhancing the attainment of the millennium development goals.

Keywords: Nigerian Women, Marco-economic Policies, Millennium Development Goals.

INTRODUCTION

The launching of the Millennium Development goals[MDGs] in the year 2000, and its adoption by the United Nations member countries in the year 2001 was aimed at reducing poverty, and enhancing the living standard of women, among other things. Being a member of the United Nations, Nigeria has employed human and material resources towards the achievement of these goals by the year 2015. We agree with Ogunlela and Mukhtar (2009), that, the MDGs would not be truly achieved without rapid agricultural output growth and according to FAO (1995), women constitute 60 – 70% of the labour used in sub-Saharan Africa. In Nigeria, agriculture has a long history of being the main stay of the economy and women have been central in the successes achieved in the sector, (World bank, 2003; Fabiyi et al, 2007; Fiesco, 1998; Buckland and Haleegoah, 1996). Achieving the MDGs require policy responses that would increase the productivity of small farmers, among other things (UNDP, 2003).

Several efforts have been made to enhance the productivity of the operators of the agricultural sector, particularly, women. For example, in 1971 the tree crops project was established, 1973 witnessed the establishment of the Nigerian Agricultural and Cooperative Bank, the Research Institute Decree and the National Accelerated Food Production Programme. In 1975, Agricultural Development Project(ADP), the First Livestock Development Project, the River Basin Development Authorities and the National Science and Technology Development agency came into being. Besides, in 1976, the Operation Feed the Nation and the strategic Grain Reserve Programme were established; the commodity Board and the Agricultural Credit Guarantee Scheme were added in 1977; the River Basin Development authorities were reorganized in 1979; the Nigerian Green Revolution Programme and the Agricultural concessionary interest rate of 6-12 per cent was introduced in 1980; the state wide Agricultural Development Programmes and the Universities of Agriculture were introduced in 1981.

The introduction of the Structural Adjustment Programme (SAP) in 1986, witnessed the deregulation of interest rate and liberalization of agricultural loans. Also tariff structures were adjusted to encourage local production. The naira exchange rate depreciation by devaluation was done to encourage

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export which resulted in increased price of imported agricultural inputs and increased cost of production. The Government initiated the banning of food items such as rice, maize, wheat and vegetable oil to encourage local production. Again, subsidies on inputs were reduced. The Directorate of Food, Road and Rural Infrastructure and National Directorate of Employment were established. In 1987, the Forestry Project II and the Livestock Project II were established. In 1993, the National Agricultural Technical Project was also established. In 1999, Fertilizer subsidy was restored as well as the product price support scheme to the Grains. In 2001, the Special Programme for Food Security was established by the President which has transformed to the National Food Security Programme in 2005.

On the whole, these policies and programmes of the Federal Government of Nigeria since 1970 were characterized by efforts to make the Agricultural sectors able to make the country self sufficient in food production.

All these policy measures are (were)to stimulate Agricultural production. Unfortunately, in the crop sector, existing literature suggest that the story is not quite as expected. In fact, Eyo (2005), reports that the index of food crops production declined from 100 in 1970 to 49.07 in 1979 and then increased steadily thereafter. Also, the average growth rate in index of staple food crop produced were -6.65 in the 1970s; 16.55 in the 1980s and only 6.68 in the 1990s.

There is considerable evidence that slower growth in agriculture relates to the macro and sectoral policy biases against it. Krueger, et al (1991) clearly documented how 18 countries taxed agriculture relative to other sectors. Interventions induced a 30 per cent decline in the relative price of agricultural products with respect to non-agricultural price index. This policy bias was largest in agriculture based countries of sub-Saharan Africa, with over valued exchange rate. High tariff protection in industry and taxes on agricultural exports all contributing to the bias. It was estimated that a 10 per cent point reduction in total taxation to the sector would increase overall annual growth by 0.43 percentage points. Since then, most developing countries have substantially improved their macroeconomic policy and reduced their biases against agriculture, particularly the agriculture-based ones with macroeconomic reforms of the 1980s. (Avalos-Sartorio, 2006; Opolot and Kureesa 2006, Robinson, 2005, Rosenzwerq ,2003; and World Bank, 2002).

A composite score comprising three key elements of sound macroeconomic policy (fiscal, monetary and exchange rate) shows a clear improvement since the mid 1990s in almost all sub-Sahara African countries (World Development Report , 2008). A positive association is also observed between improvement in that score and the performance of Agriculture. Economic evidence at the country level shows that periods of rapid growth in agriculture and substantial poverty reduction have followed reforms. (Deininger and Okidi, 2003; Fan hang and Zhang 2004; Thorbecke and Wan Jr. 2004; Teranish, 1997). Besides macroeconomic and political stability are improving in many countries as a consequence of economic and governance reforms. In Nigeria, macroeconomic and political stability have in the same manner since 1970 been improving as a consequence of several economic and governance reforms. Today, it is generally believed that the MDGs are achievable by 2015 if and only if a satisfactory macro economic environment is put in place. The question is how did the macroeconomic environment impact on the efforts of women in staple food production and what lessons are there to learn of the previous macroeconomic environment for the attainment of the MDGs in 2015. These questions are pertinent because the MDGs must focus on women because food production, hunger, poverty, environmental degradation and similar issues cannot be addressed successfully without giving adequate consideration to women, that are key actors.

Objectives of the Study

The general objective of the study is to assess the impact of macroeconomic environment on the staple food production efforts of women in Nigerian agriculture. Specifically, this study describes the trend in the output of cassava, yam and rice vis-à-vis the selected macroeconomic policy variables; analyzes the effects of the selected macroeconomic policy variables on the production efforts of women producing cassava, yam and rice and makes policy recommendations based on the research findings.

METHODOLOGY

The study area: The study area is Nigeria. It is bordered by the republic of Benin in the west, republic of Cameroon in the East, Chad republic and Atlantic ocean in the North and the Gulf of Guinea in the South. It has a total area of 923,768,64 sq. kilometers, out of which 910,770sq. kilometer is land area; and a population of 140,003,542 (Census, 2005). It has three major vegetations; mangrove around the gulf of guinea, rainforest in the South, and grassland/savannah in the North. It has two season; the wet and the dry and agriculture remains a major occupation of the people..

Sources of Data/Analysis

This study uses principally secondary data. The sources of the data are the Central Bank of Nigeria and the National Bureau of Statistics. The multiple regression analysis was the main tool of data analysis.

Model Specification

Indictors of macroeconomic policies are Government Budgetary allocation/expenditure to the Agricultural sector, credit or approved allocation and loans to agricultural sector from Commercial banks and Merchant Banks, prevailing exchange rates and concessionary interest rate to agriculture. Consequently, the relationship between macroeconomic policies and quantity of crops can be expressed implicitly as:

$$Q_i = f(X_1, X_2, X_3, X_4, X_5, T_i, D)$$

The explicit form of the model becomes:

$$Q_i = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + b_5X_5 + b_6T_i + b_7D + e$$

Where

Q_i = Output of each of the food crops (rice, yam, cassava) in metric tonnes

X_1 = Government expenditure to the Agricultural sector (in Million naira)

X_2 = Credit allocation to the crops sub sector (in Million naira)

X_3 = Nominal Interest rate to agriculture (percentage)

X_4 = Exchange rate (percentage)

X_5 = Inflation rate (percentage)

T_i = Time trend

D = Dummy variable (SAP period = 1 Pre-SAP period = 0)

e = error term

b_0 = Intercept

$b_1 - b_7$ = Co-efficient for the various exogenous variables

RESULTS AND DISCUSSION

Trend in the Output of Rice, Yam and Cassava vis-à-vis the selected macroeconomic policy variables in Nigeria from 1970 to 2005

This research shows that there has not been any sustained growth in output of staple food crops in Nigeria. Table 1.0 presents the index of average output of three staple food crops, namely rice, yam, and cassava between 1970 and 2005. According to this table, the index of rice production increased from 100 in the base year to 150.69 in the 1973 – 1975 period, it dropped consistently to 42 .05 in the 1979 – 1981 period. By 1982 – 1984 period the index of average output of rice increased to 51.09 from the previous period and then increased steadily to 949.41 in the 1991 – 93 period and then gyrated to 1109.71 in the 2003-2005. As evident from table 1, negative growth rate was recorded in the periods, 1976-1978, 1979-1981, 1994-1996, and 2000-02. The peak of growth was however recorded in the 1988-1990 when the structural adjustment policies were being implemented.

Unlike the case of rice, the index of average output of cassava declined steadily, from 100 in the 1970 – 1972 period to 24.43 in the 1979 – 1981 period. This index increased to 104.8 by the 1982 – 1984 period and a steadily thereafter to 841.25 in the 1997 – 1999 period. By the period 2000 – 2002 the index of average output of cassava dropped to 770.55 but increased thereafter to 832.48 in the 2003 – 2005 period. However, the growth rate shows a negative trend up to 1979 – 1981 period, but were positive but decreasing between the 1982 – 1984 period and the 1997 – 1999 period. It was negative (- 8.40) again in 2000 – 2002, with a slight increase to 6.61 in 2003 – 2005.

Table. 1; Index of Output of Selected Agricultural Output.

| Year | Rice | | Cassava | | Yam | |
|-----------|-----------------|-------------|-----------------|-------------|-----------------|-------------|
| | Index of Output | Growth Rate | Index of Output | Growth Rate | Index of Output | Growth Rate |
| 1970 - 72 | 100 | - | 100 | - | 100 | - |
| 1973 – 75 | 150.69 | 50.70 | 71.61 | -28.38 | 79.13 | -20.87 |
| 1976 – 78 | 90.26 | -40.10 | 41.11 | -42.60 | 65.20 | -17.60 |
| 1979 – 81 | 42.05 | -53.41 | 24.43 | -40.60 | 54.76 | -16.01 |
| 1982 – 84 | 51.09 | 21.51 | 104.80 | 329.62 | 48.89 | -10.72 |
| 1985 – 87 | 127.93 | 150.40 | 322.95 | 208.13 | 51.62 | 5.57 |
| 1988 – 90 | 783.70 | 512.60 | 422.22 | 30.74 | 112.77 | 118.49 |
| 1991 – 93 | 949.41 | 21.14 | 692.60 | 64.04 | 203.39 | 80.35 |
| 1994 – 96 | 869.99 | -8.37 | 774.46 | 11.82 | 243.56 | 19.75 |
| 1997 – 99 | 1017.70 | 16.98 | 841.25 | 8.62 | 264.20 | 8.47 |
| 2000 – 02 | 1011.44 | -0.62 | 770.55 | -840 | 252.27 | -4.51 |
| 2003 – 05 | 1109.71 | 9.17 | 821.48 | 6.61 | 279.78 | 10.90 |

Source: Computed from Central Bank of Nigeria Statistical Bulletin, 2005.

The index of average output of Yam declined consistently from 100 to 48.89 in the 1982 – 1984 period and later increased steadily to 264.2 in 1997 – 99 period and 279.78 in the 2003 – 2005 period respectively.

Table 2.0; Index of Government Allocation and Selected Macroeconomic Variables.

| Year | Fed. Govt alloc | | Credit alloc | | Interest rate | |
|-----------|-----------------|-------------|-----------------|-------------|---------------|-------------|
| | Index of | Growth Rate | Index of Output | Growth Rate | Index | Growth Rate |
| 1970 – 72 | 100 | - | 100 | - | 100 | - |
| 1973 – 75 | 736.20 | 635.15 | 242.81 | 142.8 | 0 | 0 |
| 1976 – 78 | 754.12 | 2.43 | 624.14 | 157.04 | 93.33 | -6.67 |
| 1979 – 81 | 2927.06 | 288.14 | 56.59 | -90.97 | 125.77 | 34.76 |
| 1982 – 84 | 4603.94 | 57.29 | 51.04 | -10.30 | 192.44 | 53.00 |
| 1985 – 87 | 4189.60 | -8.99 | 289.63 | 470.59 | 242.44 | 25.98 |
| 1988 – 90 | 6592.47 | 57.35 | 726.28 | 150.75 | 368.44 | 51.97 |
| 1991 – 93 | 7942.83 | 20.48 | 595.66 | -17.98 | 429.56 | 16.58 |
| 1994 – 96 | 29069.53 | 265.98 | 1056.37 | 77.34 | 300.00 | -30.16 |
| 1997 – 99 | 86074.91 | 196.10 | 1598.11 | 51.28 | 339.33 | 13.11 |
| 2000 – 02 | 905397.67 | 951.87 | 5168.87 | 223.42 | 346.67 | 2.16 |
| 2003 – 05 | 1089847.67 | 20.37 | 15301.35 | 187.90 | 324 | -6.54 |

Source: Computed from Central Bank of Nigeria Statistical Bulletin, 2005.

The growth rate, however, was negative growth rate was observed up to the 1982 – 1984 period.. Like Rice and cassava, the index of average output of yam was highest during the 1988 – 1990 period, the era of SAP. One basic fact of the growth trend for the three crops is that of inconsistency. In other words, its either policies or programmes have been inconsistent or are not properly directed to achieving their aims.

The index of government's allocation to agricultural sector shows a rise in budgetary allocation from 1970-2005. But the rate presents inconsistency in allocated funds, with the highest occurring during the 1994 – 96 period and the lowest during the introduction of SAP, 1985 – 87. However, even though the growth rate during this era was negative, the staple crops seems to have recorded the highest output, and even recorded lower growth rates when the allocations increased. This, invariably implies that the allocated funds were not effectively applied to the sector's problems.

Credit allocation to the sector vis –a –vis the food crops remains paramount of all inputs to this sector. It emphasis centers on the fact that farmers need this input to really expand production since it forms the bedrock of growth in the sector. Efforts of government towards this was observed in areas such as concessionary interest rate, establishment of government owned banks such as Nigerian Agricultural Cooperation Bank (NACB), granting of moratorium on agric loans and the creation of the Agricultural Credit Scheme Fund (ACGSF) among others. The index allocation even in the face of these gives an inconsistent scenario. The highest index credit allocation was in 2000 -02. Rice, cassava and yam recorded output indexes of 1011.44, 770.55 and 252.27 respectively. Their growth rates were as well negative.

The interest rate factor is very salient in the sector particularly in a country like Nigeria. This is because, the forces of demand and supply depend to some extent on how this factor is manipulated. Policy makers are of the opinion that the amount of borrowing from banks depend on how high or low the interest rate is. Hence, government tries to encourage borrowing by farmers by making sure banks charge lower rates for those in agric sector. Interest rate index was in 1991-93, credit allocation to food crops during this period dropped by over 130 from the proceeding years. This affected rice output as it recorded a drop in 1994 – 96. Cassava and yam however, increased marginally.

Effects of Macroeconomic Policy & Role of Women on the Production of Staple Food

Objective two of the study was to analyze the effects of the selected macroeconomic policy variables on the output of rice, yam and cassava in the country from 1970 to 2005. The effects of selected macroeconomic policy variables on the output of rice, yam and cassava was ascertained through regression analysis. The regression model is based on the fact that the output of these three crops (in metric tonnes) is dependent on the explanatory variable such as the volume of Federal Government Allocation to the Agricultural sector in million naira (Recurrent and Capital Expenditure), volume of Federal Government Credit allocation to the food crop sector (million naira), nominal interest rate, exchange rate in naira to US Dollar, inflation rate in per cent, time trend and Dummy variable.

The results of the effects of macroeconomic policy variables on the output of some major food crops in Nigeria are as presented in table 3. The time trend variable was introduced in the model to account for the technological change over time, while a dummy variable was introduced to capture policy shifts. SAP, as an economic recovery programme to combat various economic, social and political problems aimed at restructuring and diversifying the productive base of the economy to reduce dependence on the oil sector and on imports. The dummy was designed to take care of the effect of such policy shift.

In Nigeria, women play prominent role in staple food(cassava, rice, and yam) production supplying most of the labour requirements. However, Results of the regression analysis on the effects of selected macroeconomic policy variables on the output of cassava, rice and yam shows that, the Durbin Watson statistics for rice is 1.733 which confirms the absence of autocorrelation. The F-test which establishes the overall fit of the estimated equation has a F-value of 43.976 which is significant at 1 per cent level and the independent variable explained 89 per cent of the total variation in the dependent variable which is the output of rice, for the period. . Between 1970 and 2005, the yam output response coefficient in table 3 given Durbin Watson statistics as 0.775.

Table 3 : Crop Output Response Coefficients from 1970 to 2005

| Variables | | | | Regression Coefficients | | |
|----------------|------------|---------|------------|-------------------------|------------|-----------|
| | Cassava | t-value | Rice | t-value | Yam | t-value |
| Constant | 7.312 | 18.454* | 5.108 | 22.882* | 8.429 | 49.877* |
| X ₁ | -1.042E-06 | -0.380 | -1.593E-06 | -1.031 | -6.287E-07 | -0.538 |
| X ₂ | 1.008E-07 | 0.215 | -1.380E-08 | -0.052 | -6.989E-08 | -0.349 |
| X ₃ | 4.949E-02 | 0.878 | 6.494E-02 | 2.045*** | 1.296E-02 | 0.539 |
| X ₄ | -1.040E-04 | -1.296 | -2.520E-04 | -5.574* | -1.655E-04 | -4.836* |
| X ₅ | 1.704E-03 | 0.197 | 2.556E-03 | 0.524 | 3.829E-03 | 1.037 |
| X ₆ | 4.452E-02 | 1.048 | 9.023E-02 | 3.771* | 7.977E-02 | 4.404* |
| D | 0.902 | 0.834 | -0.581 | -0.953 | -0.971 | -2.106*** |
| R ² | 0.834 | | 0.898 | | 0.787 | |
| F-value | 14.375* | | 43.976* | | 18.898* | |
| Durbin Watson | 1.076 | | 1.733 | | 0.775 | |

*significant at 1%

**Significant at 5%

***Significant at 10

Source: Computer Analysis of Cassava, Rice and Yam Data 1970 to 2005.

The F-test establishes the overall fit of the estimated equation and the F-value is 18.898 and is significant at 1 per cent level. It is indicative that the independent variables were adequate in explaining the variation in the dependent variable – the output of yam. According, the cassava output coefficients in table 3.0, shows that the Durbin Watson statistics is 1.076, affirming the non-existence of auto correlation problem in the equation.

The F-test that establishes, the overall fit of the estimated equation has an F-value of 14.375 and was significant at 1 per cent confirming that the independent variables were satisfactory in explaining the variation in the dependent variable – the cassava output. Besides, the independent variables explained 83 per cent of the total variation in the output of cassava.

The result of the regression analysis also confirms that government allocation to the agricultural sector had no significant effect on the output of these staple foods and was negatively related to cassava, rice and yam output. This confirms that government allocation to the agricultural sector had no direct or indirect benefit on the farmers staple food production efforts.

Similarly, credit allocated to the food crop sub-sector over the period considered, had no significant effect on the production of cassava, rice or yam production. However, credit to the sector was negatively related to output of yam and rice but positively related to the output of cassava. This implies that output of cassava increase with increase in credit to the sector. That rice and yam output are negatively related with credit to the sector and the non significance of the credit allocation effect on the output of the staple food crops points to the fact that credit programmes do not address the target population. Similarly, nominal interest rate on loans had no significant influence, but was positively related to the output of cassava, rice and yam. However, the signs, of the regression coefficient suggests that, cassava, rice and yam production increased despite the high interest rate on loans. On the other hand, inflation rate had no significant influence but was positively related to the output of these staple food crops. This implies that high inflation rates did not deter the production efforts of the farmers as the signs of the regression coefficient confirm that output still increased with increase in the rate of inflation.

Exchange rate had significant effect on the output of yam and rice but not on the output of cassava. However, the signs of the coefficient indicate that as the exchange rate increased, the output of these staple food crops decreased. Invariably, the exchange regime never encouraged the production of these staple food crops, particularly rice and yam. Conversely, technological changes was not only positively related to but had significant effect on the output of these staple food crops. Technological changes however, were more effective in rice and yam production than in cassava production.

The dummy variable was not significant for any of the staple food crops during the pre and post SAP periods. This suggests that the macroeconomic environment of the pre and post SAP periods did not significantly affect the output of cassava, rice or yam. In fact, the macroeconomic environment of the SAP years lowered the output of rice by 0.5 metric tones, lowered the output of yam by 0.9 metric tones but increased the output of cassava by 0.9 metric tones.

Implications for Attainment of the MDGs in Nigeria

Several authors (Fellow, 2009; Fabiyi et al, 2007; Mijindadi, 1993; Benjamin, 1998; UNDP, 2003; CTA, 1993) agree that women play prominent role in cassava, rice, and yam production in Nigeria. The production efforts of women in the years considered appear to have been seriously marred by the macroeconomic environment. In fact, this research confirms that the macro economic environment created by government policies between 1970 and 2005 was not good for the staple food crop production, particularly cassava, rice and yam. This is evident from the non significance of the effect of most of the macroeconomics indicators on output of these staple food crops. Invariably, for the attainment of the MDGs in Nigeria, the on going

macroeconomic environment must be tinkered with by making gender friendly policies to benefit women who constitute the majority of the workforce in cassava, rice and yam subsectors. In particular, government allocation to the agricultural sector in general and cassava, rice and yam subsectors, in particular; credit to the sector and interest rate on loans must be made to play significant roles on the production efforts of the farmers, particularly women. This research also shows that production of cassava, rice and yam increases with increase in inflation rate but it is believed that farmers can do better if the rate of inflation is brought down to manageable levels. More so the exchange rate policy must be made to favour not only cassava production but rice and yam. The significance of the effect of technology on the production of these crops is a pointer to the fact that gender friendly technologies have continued to be introduced into these subsectors.

CONCLUSION

The trend in staple food crops vis-à-vis the policy thrust from 1970-2005 phonis a zig-zag scenario, hence inconsistency. This must be the primary focus for policy implementation if the MDGs must be achieved in 2015. Emphasis as a matter of fact must be centered on technology friendly virues, revised credit allocation to the sector and, acceptable nominal interest rate. These, when critically thought-through and implemented will improved food crop production on a sustainable level, improve the living standard of women and attainment of the MDGs easier.

Policy Recommendations

The policy implication from this study is that although Federal Government Budgetary allocations to the agricultural sector, Federal Government Credit allocation to the food crop sector continued to increase, they had no corresponding significant effects on the output of rice, yam and cassava. Accordingly, there is need to review the interplay of macroeconomic policy variables to make them have a sustainable effect on crops and the encouragement of improved technology as well as nominal interest rate with regards to staple foods.

The following recommendations are proffered in line with results of the analysis in this study:

- Women farmers will expand production through acquisition of loan with low interest rates.
- Technology friendly packages in yam, rice and cassava should be made available to women through extension agents who are women.

The growth rate in index of the staple foods in Nigeria between 1970 – 2005 shows fluctuations. In effect, it means Marco-economic policies between the period was not favourable to the production of these crops and by extension to the operators in the sector. Specifically, policies were either too harsh or were abandon half way hence inconsistency in their implementation and a backlash to the sector. However, for the attainment of MDGs by 2015, policies must be tailored to technology friendly packages, low interest rates since these two variables were significant in the production of the staple crops. This will go along way to touching the lives of women who are the major produces of these crops and significantly bring down poverty since achievement of other goals depend to a larger extend on how poverty is reduced.

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