

Idongesit Udousung¹

¹ Akwa Ibom State University

Received: 16 December 2011 Accepted: 4 January 2012 Published: 15 January 2012

Abstract

The major objective of the study was to analyze the impact of policies on capture fishery in Nigeria (1970 – 2000). The specific objectives were to assess the performance of capture fishery under different policy regimes; to identify factors that influence capture fishery output; and to draw policy implications of the Central Bank of Nigeria namely, the Statistical Bulletin, Annual Report and Statement of Accounts, Financial Review (various issues) and Nigeria Trade Summary published by Federal Office of the Statistics. The data obtained were analyzed using the Error Correction Model (ECM). The result of the ECM confirms the existence of longrun equilibrium between the dependent and independent variables. Available information reveals policy instability and duplication of programmes and projects under different policies. Analysis also shows fluctuation of capture fishery output over the years. Growth rates of fish output was found to be highest between 1996 – 2000. The ADF test indicates stationarity one-difference lagged length, except government expenditure. The policy variables included in the model were found to explain 34.8

Index terms— Macroeconomic, policies, capture fishery, Nigeria.

1 Introduction

rior to the political crisis of 1967 -1970, agriculture's positive contributions to the economy were instrumental in sustaining economic growth and stability. The bulk of food demand was satisfied from domestic output, thereby obviating the need to utilize scarce foreign exchange resources on food importation (Olayide, 1972).

However, the crisis, which developed in Nigeria agricultural sector during the civil war, became more serious in the 1970's and incidentally coincided with the rising fortunes of the petroleum sector. From that period to 1985, agriculture's contribution to the economy in terms of output growth, employment, food supplies, investments capital and linkages with the rest of the economy became relatively insignificant. This development was reflected in rising food prices, inflation increased imports of food and agricultural raw materials for local industries and deteriorating living conditions of rural dwellers (Essen, 1982). The Nigerian economic development process has suffered from dearth of holistic. The production situation in the fishery sub -sector of the Nigerian agriculture indicates that there was growth in the decade of the 1970's sharp decline in the mid-1980's, a slow recovery in the second half of the 1980 but a declining output since the 1990's (Federal Republic of Nigeria, 1997). The improvement in Nigeria's fishery sub-sector performance to a satisfactory and sustainable level and has been a challenge to policy makers in government and operators in the private sector. Hence, from the 1970 to 2000, government has adopted various policies to improve the fishery output in the country. The macroeconomic policies adopted include monetary, fiscal, exchange rate and price policies. In spite of such policy measures, significant and sustainable increase in fishery output in the country is yet to be achieved (Ukoha, 1999). For example, in the pre-structural adjustment period (1970 -1985) total agricultural production, staple food crops and fish experienced negative growth. In the few cases where growth rate were positive, the rates were very low, ranging from 1.91 percent per annum for cash crops to 2.2 percent for livestock and -0.65 for fish. This is why Nigerian government over the years had embarked on various policies/programmes to boost the agricultural production, which include crops, livestock and fishery production. Monetary policy: Monetary policy is government guideline on money supply issued periodically to regulate the volume of money in the economy. Monetary policy can be used to stimulate agricultural output growth, increase employment, stabilize prices, moderate inflation, stabilize exchange rate, reduce pressure on external sector, and induce savings as well as agricultural investment (Ele,

1 INTRODUCTION

1986). Government monetary policy has adverse consequences on the agricultural sector. It influences the availability of credit and the term structure of interest rates. If agricultural credit is readily available to the sector, farmers and other operators can obtain loans to expand output. On the other hand, monetary policy that encourages inflation will raise price of inputs such that cost of production increases. The consequence of this is that the size of operation will be drastically reduced for farmers and other operator that have limited financial resources (FAO, 1991). Fiscal Policy: Fiscal policy is the use of taxation government expenditure to control the level of economic activities. Such guidelines are useful in balancing resources available for public and private sectors such that inflation, unemployment and income inequality and pressure on balance of payment are minimized. Over the years, there have been many objectives of fiscal policy. For example, the objectives of fiscal policy in 1990 included the promotion of export of industrially manufactured goods, creating employment opportunities, providing effective protection for the local industries; enhance the use of locally sourced inputs and the reduction of tax burden on individuals and corporate bodies (Heady, 1946). The strategies of fiscal policy included: the introduction of 5% value added tax to replace sales tax; abolition of excise duties; regulation of custom and excise tariff; retention of tariff concession granted to the transport sector and imposition of custom duty and taxes on contracts or project loans.

Exchange Rate Policy: Government exchange rate policy regulates the rate at which the Naira exchanges with other currencies of the world. The objective of this policy is to realign the exchange rate of the Naira vis-à-vis the major world currencies; to create an equilibrium exchange rate for the Naira in a free market economy (Okigbo, 1986). The strategies of the exchange rate policy are: Pegging of Naira exchange rate to a dollar; introduction dual exchange rate between 1995 and 1999 and allowing the forces of demand and supply to determine the exchange rate. Fisheries development policies and programmes pre-dates Nigeria's independence in 1960. A search of the literature (Tobor and Ajayiu, 1992) reveals that, with the replacement of import from Europe owing to Second World War (1939-1940-1941-1942-1943-1944-1945), the colonial government was promoted in 1942 to work out fisheries development policies/programmes for Nigeria. On attainment of independence in October 1960, the country commenced a number of fisheries development policies/programmes within the context of 5 -years National Development Plans in 1974, but with effect from 1975-1980 and (1981-1986) from 1990, the 5year development plans were replaced with 3-year rolling plans i.e. 1990-1992, 1993-1995, 1996-1998 and 1999-2001 respectively (Tobor and Ajayiu, 1992).

The fisheries development policy/programmes in Nigeria have spanned the period of 30-years. Nevertheless, the main objective of this development programmes, which is to make Nigeria self sufficient in fish production and supply is still an illusion. Available records show that 40 years of political independence (October 1960 -October -2000)), the government of Nigeria changes hands twelve times, some regimes lasting for less than one year. The instability in the political structure or leadership in the country also resulted in frequent changes in the trust of agricultural policy (Jaeger, 1990). Some policies were introduced without any genuine political or economic reasons, but merely because they sounded different from previous ones. The Marine Fishery Development Project was designed to provide the basic infrastructural facilities to fishing settlements, the National Accelerated Fish Production Project focused on bringing the benefits of modern technology to replace the traditional method of fishing, Nigerian Agricultural, Cooperative and Rural Development Bank Ltd. was designed as a specialized credit and rural development institution while Agricultural Development Projects (ADPs) were extension oriented, saddled with the provision of improved fingerlings and introduction of new techniques of fishing. Records also show that during the period, the country was virtually self-sufficient in food. Ogbé (1984) reported that it was hoped that adequate food would continue to be provided through private initiative with little government intervention. The Commencement of National Development Plan (1975-1976-1977-1978-1979-1980): This period cut across three successive governments -Murtala Mohammed (1975-1976), Olusegun Obasanjo (1976-1977-1978-1979) and Shugu (1979-1983)). This administration introduced quite a number of policies and programmes among which are Operation Feed the Nation (OFN) (1976), River Basin Development Authority (RBDA) and Inshore Fishery Project (IFP), all established in 1977. Operation Feed the Nation (OFN) was to mobilize the public to take active part in fish production. The River Basin Development Authority (RBDA) was saddled with the responsibility of developing the country's land and water resources. Inshore Fishery Project was to upgrade the indigenous fisheries to a modern trawling and the provision of modern size multipurpose fishing boats (Moses, 1989) The civilian regime of Shugu Shagari (October 1979-December 1983) also witnessed quite a number of policies/programmes in fishery sector in particular and agricultural sector in general some of which were Green Revolution (GR) and Fish Seed Multiplication Project (FSMP). The Green Revolution, which was a mere rechristening of the Operation Feed the Nation (OFN) of the military administration of Obasanjo. It only further articulated the agricultural development project extending to cover the entire country. The programmes involved the provision of improved fingerlings and credit facilities to farmers, appropriate mechanization, and improved marketing system. The target was to make the country self-sufficient in basic food production within five years and to rehabilitate and restore the production of export for seven years. Sea Fisheries and Inland Fisheries Decrees established in 1992 was to include wide provision for regulation of catch species, sizes and fishing zones. Regulations set minimum net size for both finfish and shrimp in order to preserve the fish stock from over fishing. The second National Development Plans (1981-1982-1983-1984-1985) did not have a smooth ending due to military intervention in 1983, with Mohammadu Buhari as the Head. The regime did not produce any reasonable

agriculture policy/programmes; rather effort was on River Basin Development Authority. The number of River Basin Development Authority (RBDA) was increased from eleven to eighteen in 1984. From August 1985 to August 1993 Nigeria passed through another military regime headed by Ibrahim Bahangida. This period marked the introduction of 3-year rolling plans, which did not do well in the fishery sub-sector.

Another change occurred (1993) (1994) (1995) (1996) (1997) (1998) with Sani Abacha as the Head of the regime, this period witnessed two successive rolling plans of (1993) (1994) (1995) and (1996) (1997) (1998). Between the Third rolling plans and Fourth rolling plans was the introduction of Sea Fishery and Inland Fishery Decree saddled with the responsibility of regulating species size and fishing zone. 2000 there was establishment of Fish Farm Training Centre to cater for the training of school leavers and fishermen on the new method of fishing to replace traditional methods.

2 a) Objectives of The Study

The general objective of the study is to assess the performance of artisanal fishery in Nigeria from 1970 to 2000.

3 II. methodology a) Data and Data Sources

The empirical analysis for this study covers the period 1970 to 2000. Only secondary data were used for analysis. Data were collected on such variables as the quantity and value of fish captured and fish import within the period; government expenditure, credit and the exchange rate in the country for the same period. The choice of time period (1970 -2000) is based entirely on the availability of data and the need to make allowance for loss of observation.

4 b) Method of Data Analysis

The study uses trend analysis in presenting variations in quantity and value of fishery output for the period under study. Such statistic as average annual quantity and value of import over the years, difference in means between pre-SAP and SAP period and coefficient of variation were used to present the analysis. For the empirical analysis, the study employed Error Correction Model (ECM) to analysis fish output in Nigeria. The need to avoid the incidence of spurious regression, which may render the empirical analysis of regression results invalid, necessitated the adoption of recent development in econometric techniques used this study (Engle and Granger, 1987).

Further more, it has been noted that the estimation techniques such as OLS can be applied to estimate a regression model with time series data only when all the data are stationary. In a situation where non-stationary variable (data) are to be included in a regression, first difference forms should be used. This therefore implies that for appropriate modeling of the relationship between economic variables and in order to be able to make valid inference from findings, as well as to investigate the time series characteristics of the variables in the model as to know whether they are stationary or not.

5 Empirical Model

$Q_t = f(E_t, Q_{t-1}, F_{t-1}, CR_t, G_t + U_t)$ Where: Q_t = Quantity of fish capture in presence year - F_t E_t = Exchange rate Q_{t-1} = Quantity of fish captured previous year F_{t-1} = fish import CR_t = Credit facilities G_t = Government Expenditure $t-1$ = indicates the lagged variables c) Estimation Technique The equations were estimated using Ordinary Least Square (OLS). The model of the study is a single equation Model made up of a dependent variable and five (5) independent (explanatory) variables. The method of multiple regression analysis will, therefore, be used to evaluate the relationship between the dependent variable and the explanatory variables. Two methods of estimating the coefficients of economic relationship exist namely:

Single-equation techniques are applied to one equation at a time whereas the simultaneous-equation techniques are applied to all equations of a system at the same time. This implies that single-equation techniques like Classical Least Square (ILS), Two-Stage Least Square and other mixed estimation methods are used for single-equation models. Simultaneousequation techniques such as Three-Stage Least Square and Full Information Maximum Likelihood techniques (FIML) are used for system equations.

Ordinary Least Square (OLS) estimation technique become imperative in this study because of the single-equation model since it involved simple phenomenon, which can be satisfactorily approximated with a single-equation model (Koutsoyiannis, 1985). Secondly, the purpose of the study is mainly for analysis Ordinary Least Square (OLS) also has the advantages of simplicity of computation procedure, data requirements are not excessive and hence, it is less expensive and less time consuming. The mechanics of Ordinary Least Square are quite simple to understand and it is component of most other econometric techniques. In fact, with the exception of Full Information Maximum Likelihood technique, all other involve the application of Ordinary Least Square. This technique has produced fairly satisfactory results when used in a wide range of economic relationships and it is most commonly used in estimating relationships in economic models (Koutsoyiannis, 1985).

6 d) Stationary Test

In this study, the Augmented Dickey -Fuller (ADF) unit root test was used to test for the stationarity of the data (Dickey and Fuller, 1979). The ADF test involves running a regression of the first difference of the series against the series. Using Augmented Dickey Fuller (ADF) test, we run a regression as: $X_t = 1 + 1 t + X_{t-1} + t-1 + t$

and then carry out the t-test to know whether the coefficient is statistically significant or not. Then ADF t-statistics were used to compare the critical values at between 1 and 10 percent in order to determine whether the variable X_{t-1} has a unit root.

7 e) Co-Integration Test

Co-integration has assumed increased importance in analyses that purport to describe long run or equilibrium relationships. An equilibrium relationship exists when variables in the model are co-integrated. A necessary condition for integration, however, is that the data series for each variable involved exhibit similar statistical properties, that is, be integrated to the same order with evidence of some linear combinations of the integrated series. A variable is integrated of order $I(0)$ when it is stationary in level form. A stationary series X_t for example has a mean, variance and autocorrelation that is constant over time (Tambi, 1998). However, most economic series tend to exhibit non-stationary stochastic processes of their form.

Co-integration test was carried out to avoid spurious regression. For this purpose ADF test was applied to test residuals (u) of the static co-integrating regression as follows: $t = \alpha t-1 + 1 t-1 + c$ (1)

Where the t-test of the α (parameter of H_{t-1}) is compared to the ADF statistics at the various levels. Co-integration implies that the long-run movements in the variables are related to one another in a long-run equilibrium relationship. The Johansen (1991) Johansen (, 1995) efficient maximum likelihood test is used to examine the existence of a long-term relationship between macroeconomic policies on one hand and the capture fishery on the other, at the 5 and 1 percent levels of significance respectively. Studies by Barret and Arcese (1995), among others, provide ample evidence supporting the use of the Johansen approach over alternative tests. From Engle and Granger (1987), it is obvious that an Error Correction situation will arise showing the degree of adjustment towards long-run equilibrium. In other words, the model tells what proportion of the disequilibrium in one variable in one period is corrected in the next period. The Error Correction Model for 2 variables X and Y is generally stated as: $t = \alpha + 1 t + 2 : t-1 + t ?$ (2)

The value of 1 (coefficient of $t-1$) shows this degree of adjustment. Given the establishment of stationarity and/or co-integration in the variables, the bivariate Granger causality regressions as shown below are estimated where: $t = \alpha + 1 t + 2 \text{ ECM } -1 + t$ (3)

Here Y_t and X_t are stationary time series. The causality test shows whether past changes in one stationary variable X_t helps to predict changes in another stationary variable Y_t , apart from the impact of past changes in X_t itself. If so, then X does "Granger cause Y " otherwise, X does not "Granger cause Y ". The hypothesis that X does not Granger because Y is rejected if the u_t 's are jointly significantly.

8 f) Error Correction Model

The next procedure is Error Correction Model (ECM) this analysis is used to investigate further whether there is long-run relationship among the variables. This is necessary because economic variables may not be stationary individually, a mechanism could still exist that prevents some of the variables from diverging significantly from each other. This was done using the Johansen (1980) framework for finding whether cointegrating relationship exist among the variables by comparing likelihood ratios against their corresponding critical values at 5 percent. If the various tests performed support the fact that co-integrating relationship exist between dependent and any (or a combination) of its explanatory variable then we need to setup a parsimonious Error Correlation Model (ECM). The ECM is then used to analyze the response of fish import to a stimulus in the explanatory variables in a dynamic setting. The ECM is accepted when the residuals from the linear combination of non-stationary $I(1)$ series are themselves stationary. The acceptance of ECM implies that the model is best specified in the first difference of $i-1$

Impact of Macroeconomic Policies on Capture Fishery in Nigeria, Global Journal of Management and Business Research Volume XII Issue XX Version I 2 2012 ear Y its variables. Thus the application of co-integration paradigm will guard against the loss of information from long-term relationships in the first differences. The Error Correction Model (ECM), which is a method of dynamic modeling employing co-integrate economic theory useful in characterizing a long-term equilibrium with an observed disequilibrium by building a model that explicitly incorporates behaviour that would restore the equilibrium. A prerequisite of the ECM estimation is the determination of the time series properties of variables in the model so as to ascertain whether they are stationary or non-stationary. The use of the ECM is facilitated when variables are first differenced and cointegrated. Since the estimation method such as "Least Square" can be applied to time series data only when all the data series are stationary, then the first difference forms should be used if non-stationary variables are to be included in a regression exercise. For example, for a random walk or non-stationary variable X_t $X_t = X_{t-1} + e_t \sim N(0, \sigma^2)$ (??)

The first difference of X_t can be written as: $X_t = e_t$, which is by definition a stationary process is a method of classification for non-explosive processes is that variables that are stationary processes are denoted by $I(0)$, those that become stationary processes by taking first, second differences are designated as $I(1)$, $I(2)$, etc. so the expression $I(d)$ means "integration of order d ". The statistical tests to determine whether each of the economic variables is $I(0)$ are 1: the Dickey -Fuller (DF), and 2: the Augmented Dickey -Fuller (ADF) test.

The DF test (Fuller, 1976, Dickey and Fuller, 1979) is carried out by applying a regression such as $X_t = \alpha + \beta t + \gamma t^2 + \delta t^3 + \epsilon_t$ (5)

The variable and comparing the t -value with Fuller (1976) distribution table. If the t -values is significantly negative the variable is regarded as $I(0)$ instead of $I(1)$ in the ADF test, regression such as $X_t = 1 + 2t + X_{t-1} + t + \epsilon_t$ (6)

A popular past method of attempting to overcome the problem of spurious correlation has been to estimate the relationships between the rates of change of variables rather than between the absolute levels. The effect of looking at the rate of change in a variable is typically to remove any trend element. (Noise or disturbance) that is, many non-stationary economic time series become stationary when they are first differenced. For instance, while output and prices in most post-war economies have trended steadily upwards, this is not generally true of rate of growth in output or of inflation rates. Unfortunately, when attention is concentrated on relationships between rates of change, there is real danger that valuable information on the long-run relationships between the levels of variables will be lost. For example $Y_t = \alpha + \beta_1 X_{t-1} + \beta_2 X_{2t} + \epsilon_t$ (7)

Where ϵ_t is a disturbance, then $Y_t - Y_{t-1} = \alpha + \beta_1 (X_t - X_{t-1}) + \beta_2 (X_{2t} - X_{2t-1}) + \epsilon_t$ (8) Where: $t = t - 1$ If estimating equation 2, instead of equation 1, then would not obtain information about α . equation focuses purely on the short run -relationship between Y and X and, hence, is likely to provide poor forecasts for even a few periods ahead if a long-run relationship exists but is ignored. There is a further problem with first differenced equation 7. If a relationship such as 6 really exists and its disturbance ϵ_t is non-autocorrelated, then disturbance ϵ_t in equation 7 is of simple moving average form and hence will be auto correlated. First differencing then is an unsatisfactory method of dealing with spurious correlation problem. A major advantage of Error Correction Models (ECM) is that their result in equations with first-differenced and hence stationary dependent variables but avoids the problem discussed above. When economic time series are co-integrated, their relationship is most efficiently estimated by an Error Correction Model which incorporate short-run impacts as well as feedback effects to indicate the speed of adjustment to long-run equilibrium (Engle and Granger, 1987).

9 III.

10 Results and Discussions

This chapter examines the performance of capture fishery sector under various macroeconomic policies/programmes in Nigeria.

The major thrust of government policy is the achievement of sustained increase in the quantum of fish output but regrettably the fishery potentials of Nigeria are high, but they are yet to be fully exploited, the current situations indicate that the performance of capture fishery is below the expectation with the consequence that Nigeria now has to import fish in order to feed its population. The capture fishery production in Nigeria fell short in demand of 1.5 million tones by 66%. This in effect means that in order to meet the present demand exclusively from the country resources, domestic production will have to increase to meet the targeted population. a) The Pre-SAP period 1970 -1985 Within this period, the average output or quantity of fish capture (in tons) stood at 125.5 tons, judging the performance from the average output, one is convinced to state that the performance was impressive. These impressive performance were probably due to direct monetary control techniques employed until June 1986. The monetary policy in this period featured concessionary interest rates. For example agriculture lending rate was fixed at 0.5 percent points above the minimum rediscount rate and about 2-3 percent point below the prime leading (Balagun and Out, 1991). This policy was aimed at providing incentive to farmers. To execute this policy, banks and other financial intermediates were made to support agricultural sector or sub-sectors activities through credit quotas.

11 i-1

The fiscal policy during this era featured increased Federal Government expenditure on agriculture sector. For example, the average annual real Federal capital expenditure on agriculture was N 210.41 million in the period 1970 -1974 or 5.91 percent of total Federal Government real capital expenditure on all sectors. But in the period 1980 -1985, the average annual real Federal capital expenditure to agriculture rose to N 734.92 million or 6.93 percent of total real Federal capital expenditure to all sectors. Part of the allocation to agricultural sector was in form of inputs, subsidies. Concessionary tax measures such as tax holidays, removal of export taxes on agricultural commodities and income tax relief for new agricultural ventures were adopted (Ukoha, 2000).

Prior to SAP, exchange rate was usually fixed by the monetary authorities (Central Bank of Nigeria) against major international currencies. Foreign exchange was rationed in order to maintain the exchange rate, the exchange rate policy amounted to over-valuation of the exchange rate and resulted in inflow of cheap import of fish and fish products, which discouraged fishery production. The over-valuation of Naira exchange rate also put agricultural exports at a disadvantage.

b) The SAP period: 1986 period: -1993 As in the Pre-SAP period, this period also featured the use of monetary, fiscal and exchange rate. During this period, the average quantity or output of fishery sub-sector started to decline from 125.4 tons to 77.5 tons and -38.2 percent (change in output). The decrease in average quantity of capture fish is contrary to a prior expectation in the SAP era, it is believed that most beneficiaries of fishery sub-sector credits might not been actual farmers. This unimpressive performance could also be attributed to the fact that, in the 1986 economic reform, interest rates were deregulated and agricultural loans were granted with higher rates of interest than previously, while agricultural loan terms were liberalized. During this period agricultural output responded positively to agricultural credits, in order words, changes in agricultural output moved in the same direction with changes in agricultural credits in the SAP period.

In this period the Federal Government real capital expenditure on agriculture declined from N 734.92 million in the immediate Pre-SAP period (1980 -1985) to 392.49 million in the first phase of SAP and finally to N189.80 million in the later phase of SAP (1991 -1996). As a result, the share of agriculture in Federal Government capital expenditure declined in real terms to 6.49 percent in the first phase SAP and subsequently to 2.2 percent in the later phase. The fiscal policy was not quite favorable to the fishery sub-sector. For instance, from the immediate pre-SAP (1984 -1985) to the early period of SAP (1986 -1989), the prices of fishing input rose by 129.77 percent for outboard engine, 389.5 percent for buoy and 2919.05 percent for canoe/boat (Ukoha, 2000). Also, in the SAP period some essential feature of exchange rate was adoption of a flexible exchange rate, the first exchange practice introduced at the inception of SAP in 1986 is the Second -Tier Foreign Exchange Market (SFEM) this market was established by law for buying and selling of foreign exchange at market determined rate. Consequently, single foreign exchange market (FEM) emerged which replaced SFEM (Ndebbio, 1991). The rationale for having one foreign exchange market (FEM) was, to encourage among other things the inflow of foreign capital investment into Nigeria. The exchange rate during SAP period also influence the fishery sub-sector positively.

c) The Post-SAP period: 1994 period: -2000 During this period the average quantity stood at 94.4 tons which, shows an increase of 21.81 percent over the preceding period. Monetary, fiscal and exchange rate adopted the post-SAP era also have a spilled over effect during the post-SAP period. This period recorded favourable performance in the fishery sub-sector. However, these policies were distorted by the fiscal operations of the government that involved budget deficits that caused rapid depreciation of the Naira exchange rate. Foreign exchange practices such as the hoarding of foreign exchange for speculation purposes, etc. also accounted for the rapid increase in the price of imported fish, inputs and increase cost of production (Ukoha, 2000).

IV. 2 shows that quantity of fish, exchange rate, fish import, government expenditure and credit facilities to fishermen are not stationary at levels because the ADF statistics are lower than the critical ADF. Except government expenditure, which shows stationarity at lagged 1 and 2, the ADF statistics is greater than critical ADF. Test of co-integration was also carried out on the data in order to establish the existence or otherwise of equilibrium relationship between the relevant variables.

12 Impact of Policy on Capture Fishery

V. Differencing variables in different lagged length reveals that some of the variables that were not stationary at the zero (0) lagged length became stationary at first differencing. For instance, quantity of fish, exchange rate, fish import and credit facilities. This help to eliminate the problem of spurious regression normally obtained from the regression of two or more non-stationary series.

13 Test of Co-Integration

14 VI.

Results of One-Period Lagged with Difference. Source : Extract from computer output.

Using one -period lagged with difference, the exercise reveals that at 5 percent critical value t and t were statistically significant at one-period lagged. Whereas t , t , and t were all significant at 5 percent at 0 -period lagged, while t was significant at 1 percent at 0 period lagged. Further test of the variables at different lagged length shows that all variables were significant.

VII. Source : Computer printout Table 5 shows that the explanatory variables explained 35 percent of the movement i.e there is autocorrelation. Table 5 shows that the explanatory variables explained about 35 percent of the movement. Test for t -statistic shows that fish import (FIMP t) and credit facilities (Cr t) were the only variables that were significant at 1 percent level. However government expenditure (Ge t) and exchange rate (Er t) were not significant. The value of Dubin Watson (DW) statistic also show that there is positive autocorrelation, R² shows that only 35 percent of the variations in capture fishery output are explained by the included variables.

15 Results of Ols Static Model Estimation

16 VIII.

17 Normalized Co-Integrating Coefficient Equation

18 Johansen Co-Integration Test

The result of the Johansen Co-integration test is present in Table 8 comprising the likelihood ratio against the critical the null hypothesis that there is no cointegrating, the researcher then adhered to the alternative hypothesis that co-integration exists. Note: ** denotes rejection of the null hypothesis at 1% significant level.

L.R. Test indicates one co-integrating equation at 5% significant level. The rank of this equation is 1 (i.e. $r=1$). The result of the Johansen Co-integration test is presented in Table 8 comparing the likelihood ratio against the critical value at 5 percent in (a) we reject the null hypothesis that there is no co-integrating vector, but accept the alternative hypothesis that one co-integrating vector exists. The long-run test indicates that one cointegrating equation exist (at 5% significant level) in the set of normalized co-integrating equation which shows the long-run relationship between the variables.

19 a) Major Findings

This study investigated the impact of macroeconomic policies on capture fishery in Nigeria (1970 -2000). Secondary data were used in this research work and were collected from the Central Bank of Nigeria Statistical Bulletin (various issues) and Federal Office of statistics. The data obtained were analyzed using the Error Correction Model (ECM). The result of the ECM confirmed the existence of long run equilibrium between the dependent and independent variables. Available information reveals policy instability and duplication of programmes under different policy. Analysis also shows fluctuation of capture fishery output over the years. The policy variables included in the model found to explain 34.8% of the variability in fish output.

20 b) Policy Recommendations

In view of the findings of this study, the following recommendations are made. First, the government should increase the credit facilities to the fishermen, since output moved in the same direction with changes in credits.

Second, piecemeal policy measures should be avoided because they might be in conflict with one another.

Third, to cushion the fishermen from the impact of high costs of fishery inputs, the study suggest the provision of subsidies on fishery inputs.

Fourth, to improve the real wage of fishermen, the study recommend measures, which will raise their productivity. One of such measures is encouragement of the fishermen to use modern fishing technologies Finally, to increase fishermen access to credit, banks and agricultural credit extension officers should



Figure 1: Global

This era witnessed the introduction of Marine Fishery Development Project (MFDP) (197), Agricultural Development Project (ADP) (1970), National Accelerated Fish Production Project (NAFPP) (1972) and Nigerian Agricultural, Cooperative & Rural Development Bank Ltd. (1973).

Figure 2:

and policy making
Year
Single-equation techniques, and Simultaneous-equation techniques

Figure 3:

1

Policy regime		Average output	Change in Output
Period	Acronym		
1970 -1985	Pre-SAP	125.4	-
1986 -1993	SAP	77.5	-38.2
1994 -2000	Post-SAP	94.4	21.81

Figure 4: Table 1 :

2

Variable	t-ADF	% lag	t-lag	Probability
Qf t	-1.3593	14.451	2	-0.68582
Qf t	-1.6822	14.297	1	1.4067
Qf t	-1.3491	14.564	0	
Er t	-0.16894	1.5269	2	-0.38930
Er t	-0.49892	1.5205	1	2.9853
Er t	0.34196	1.7365	0	
Fimp t	-1.6835	5063.9	2	-0.25628
Fimp t	-1.9116	4968.3	1	-1.3091
Fimp t	-2.8699	5036.1	0	
Ge t	8.3297	41446	2	-3.9193
Ge t	8.3297	52161	1	-9.263
Ge t	0.074033	1.0647e	0	
Cr t	-2.1302	1394.3	2	1.3047
Cr t	-1.7713	1403.5	1	0.59413
Cr t	-2.3098	1086.0	0	

Source : Computer printout

The stationarity test result presented in Table

Figure 5: Table 2 :

3

Variable	t-ADF	% lag	t-lag	Probability
t	-2.4073	14.735	2	-1.243
t	-4.0195**	14.901	1	1.2001
t	-4.1809**	15.032	0	
t	-1.8635	1.4923	2	-1.4376
t	-2.9970*	1.5251	1	1.0187
t	-2.8683	1.5263	0	
t	-2.9467	5286.9	2	-0.72514
t	-5.0099**	5234.4	1	0.81784
t	-8.1576**	5199.7	0	
t	2.4884	69084	2	-3.6562
t	0.19030	85042	1	-3.3602
t	-6.5770**	1.0104e	0	
t	-3.2472*	1500.5	2	1.1333
t	-3.1212*	1509.3	1	1.57216
t	-5.3155**	1488.9	0	

Source : Computer Printout

Figure 6: Table 3 :

4

Variable	t-ADF	% lag	t-lag	Probability
t	-4.118**	14.410	1	1.1843
t	-4.3068**	14.517	0	
t	-2.6464	1.5247	1	0.71041
t	-2.6308*	1.5106	0	
t	-5.0057**	5183.4	1	0.79455
t	-8.1720**	5147.9	0	
t	0.71749	83132	1	-4.0684
t	-6.0981	1.0436e	0	
t	-3.2420	1453.9	1	-06441
t	-5.5301	1438.1	0	

Figure 7: Table 4 :

5

Figure 8: Table 5 :

6

Qf t	FIMP t	CR t	Constant
100.1	0.001605	-0.006993	
(9.726)	(0.0007467)	(0.00241)	100

Source : Computer printout

Figure 9: Table 6 :

8

	Eigen value	Likelihood tio	ra-	5% critical value	Hypothesized nos. of co- integrating equation	Series in the equation
(a)	0.770236	104.4029		94.15	None**	LQTY/LPRC
(b)	0.666182	64.69397		68.52	At most 1	LOTPR LGDP
(c)	0.461938	35.07067		47.21	At most 2	EXR LOTPO
(d)	0.407166	18.33657		29.68	At most 3	
(e)	0.138936	4.219860		15.41	At most 4	
(f)	0.006682	0.181023		3.76	At most 5	

Figure 10: Table 8 :

¹Impact of Macroeconomic Policies on Capture Fishery in Nigeria, ©2011 Global Journals Inc. (US)

²© 2012 Global Journals Inc. (US)

³©2011 Global Journals Inc. (US)

⁴Global Journal of Management and Business Research Volume XII Issue XX Version I

[Ojo] , M Ojo .

[Introductory Statistics for Business and Economics. New York] , *Introductory Statistics for Business and Economics. New York* 85.

[Wanncott and Wannacott ()] , R S Wanncott , T H Wannacott . 1972.

[Shaib Adedipe Aliyu Jir ()] ‘(eds) Integrated Agricultural Production in Nigeria: Strategies and mechanisms for food security’. *Proceedings of the National Workshop on Nigeria” Position at the World Food Summit*, B Shaib, N O Adedipe, A Aliyu, M M Jir (ed.) (the National Workshop on Nigeria” Position at the World Food Summit Abuja) 1991. 1997. July 31 -August 2, 1996. NARP. p. . (Agricultural Policy for Nigeria, Abuja. 19. Food and Agricultural Organization)

[Timber et al.] *1983): Food Policy Analysis*, C P Timber , P F Walter , S R Pearson . Baltimore: The Johns Hopkins University Press: for the World Bank. p. .

[Tobor ()] *A Fishery Policy for Nigeria. Paper Presented at FISON*, J G Tobor . 1994. Quarterly Public Lecture.

[Ogbe ()] *A Review of the Nigeria Economy 1960 -1983. Bullion. Central Bank of Nigerian*, N E Ogbe . 1984. p. .

[Olayide ()] ‘Agricultural Productivity and Increased Food Production Under Economic Development in Nigeria’. S O Olayide . *Proceedings of the 1972 46. Romer, P. M. 1989*), (the 1972 46. Romer, P. M. 1989) Washington DC) 1972. World Bank. (What Determines the Rate of Growth and Technological Change? Working paper 279)

[Stiglitz ()] ‘An Agenda for Development in the 21 st Century’. J E Stiglitz . *Stiglitz Conference Proceedings*, B Pleskovic, JE (ed.) 1998. Annual World Bank. p. .

[Anon ()] C Anon . *Fisheries Statistics of Nigeria*, (Abuja Nigeria) 1990. p. 31. (Federal Department of Fisheries)

[Barret and Arcese ()] ‘Are Integrated Conservation Development Projects Sustainable? On the Conservation of Large Mammals in Sub-Saharan Africa’. C B Barret , P Arcese . *World Development* 1995. 23 p. .

[Bishop and Toussaint ()] C C Bishop , W D Toussaint . *Introduction of Agricultural Economics Analysis*, 1985.

[Tambi ()] ‘Co-integration and Errorcorrection Modeling of Agricultural Export Supply in Cameroon’. N E Tambi . *Agricultural Economics* 1999. 1999. 20 p. .

[Engle and Granger ()] ‘Cointegration and Error-correction: Representation, Estimation and Testing’. R F Engle , C W J Granger . *Econometric* 1978. 55 p. .

[Ukoha ()] ‘Consistency of Agricultural Policy in Nigeria: the Case of Macroeconomic Policies’. O O Ukoha . *Journal of Sustainable Tropical Agricultural Research* 2001. 2 p. .

[Balogun and Out ()] ‘Credit Policies and Agricultural Development in Nigeria’. E O Balogun , M F Out . *Economic and Financial Review* 1991. 29 (2) p. .

[Tobor and Ajayi ()] ‘Current Management of Fisheries Resources for Sustainable Development in Nigeria’. J G Tobor , T O Ajayi . *NIOMR Technical Paper* 1992. 77.

[Stiglitz ()] *Development Thinking at the Millennium. Keynote Address, Annual World Bank Conference*, J E Stiglitz . 2000. Washington DC.

[Development Bank ()] *Economic and Social Statistics on Africa*, African Development Bank . 2000. New York: Oxford University Press.

[Ele ()] *Economic Appraisal of Groundnut Production and Marketing in Nigeria*, I E Ele . 1986. 1969-1984.

[Okon ()] *Economics of Fish Production in Atu Beach*, U E Okon . 2004. Calabar South L.G.A, Cross River State; Calabar. Agricultural Economics and Extension Degree), Thesis. University of Calabar (Unpublished B. Agriculture)

[Federal Ministry of Agriculture Water Resources and Rural Development (FMAWRRD) ()] ‘Federal Ministry of Agriculture’. *Water Resources and Rural Development (FMAWRRD)* 1988.

[Moses ()] *Fisheries of the Cross River State of Nigeria: A Preliminary Report. Fisheries Division, Ministry of Agriculture and Natural Resources*, B S Moses . 1980. Calabar.

[Moses ()] *Fisheries of the Cross River State of Nigeria: A Preliminary Report. Fisheries Division, Ministry of Agriculture and Natural Resources*, B S Moses . 1990. Calabar.

[Tapsoba ()] ‘Food Security Policy Issues in West Africa: Past Lessons and Future Prospectsa Critical Review’. E K Tapsoba . *FAO Economic and Social Development Paper 93. FAO*, (Rome) 1990.

[Development Bank ()] *Fostering Good Governance in Africa*, African Development Bank . 2001. New York: Oxford University Press.

[Ita ()] *Inland Fishery Resources of Nigeria, CIFA Occasional Paper No. CIFA/OP20 FAO of the UN*, E O Ita . 1993. Rome. p. 120.

20 B) POLICY RECOMMENDATIONS

- [Akah ()] *Input Utilization in Capture Fisheries in Esuk Nsiding in Calabar Metropolis of Cross River State*, D F Akah . 2004. Calabar. Agricultural Economics) Degree, University of Calabar (Unpublished B. Agriculture)
- [Fuller ()] *Introduction to Statistical Time Series*, W A Fuller . 1976. J. Wiley & Sons, Inc. New York.
- [Kunzel ()] 'Investigations on the Trawl Fishery in the Cross River Estuary Nigeria'. U , T Kunzel . *Journal of Applied Ichthyology* 1991. 7 p. . Unpublished M.Sc Thesis. University of Ife, Ile-Ife. 31. Lowenberg,
- [Aschauer ()] 'Is Public Expenditure Productive?'. D A Aschauer . *Journal of Monetary Economics* 1989. 23 p. .
- [Easterly and Levine ()] 'It's Not Factor Accumulation: Stylized Facts and Growth Model'. W Easterly , R Levine . *The World Bank Economic Review* 2001. 15 (2) p. .
- [Kusemiji ()] *Keynote Address Proceeding, 4 th Annual Seminar of the Committee of Director's of Research Institutes (CODRI)*, K Kusemiji . 1991. NIMOR, Lagos. p. . (Fisheries Development In Nigeria: A Critical Appraisal)
- [Koutsoyiannis ()] A Koutsoyiannis . *Modern Microeconomics*, 1979.
- [Koutsoyiannis ()] A Koutsoyiannis . *Theory of Econometrics*, (New York) 1985. Oxford University Press.
- [Dickey and Fuller ()] 'Likelihood Ratio Statistics for Autoregressive Time Series with a Unit'. D A Dickey , W A Fuller . *Econometric* 1979. 49 p. 107.
- [Umoh ()] 'Macroeconomic Environment and the Perennial Crops'. G S Umoh . *Global Journal of Agricultural Science* 2003. 2 p. .
- [Ukoha ()] *Macroeconomic Policy and the Effects on Agricultural Output in Nigeria*, O O Ukoha . 1999. Winrock International, USA. p. .
- [Johansen and Josephine ()] 'Maximum Likelihood Estimation and Inference on cointegration with Application to the Demand for money'. S Johansen , K Josephine . *Oxford Bulletin of Economic and Statistic* 1990. 52 p. .
- [Ajayi and Tobor ()] *Non-availability and high cost of credit and inputs as major disincentive in fish production in Nigeria. Proceeding, 4 th Annual Seminar of the Committee of Directors of Research Institutes*, T Ajayi , J G Tobor . 1991. NIMOR, Lagos. p. .
- [Moses ()] 'Prefeasibility Study Fisheries Pilot Project for Implementation by the Cross River Agricultural Development Project (1989 -1991)'. B S Moses . *Cross River Agricultural Development Project*, (Calabar) 1988.
- [Heady ()] 'Production Function from a Random Sample of Farms'. E O Heady . *Journal of Farm Economics* 1946. 28 p. .
- [Heathfield ()] *Production Functions, Macmillan Studies in Economics*, D F Heathfield . 1971. New York: Macmillan Press.
- [Claque et al. ()] 'Property and Contract Rights in Autocracies and Democracies'. C O Claque , S Keefer , M Knack , Olsen . *Journal of Economic Growth* 1996. 1 (2) p. .
- [Tatom ()] 'Public Capital and Private Sector performances. The Federal Reserve Bank of'. J A Tatom . *Saint Louis Review* 1991. 73 (3) .
- [Ukpong ()] 'Some Strategies for the Development of Nigeria Sector in the 1990s'. G E Ukpong . *Economic and Financial Review* 1993. 31 (2) p. .
- [Balogun and Evbuomwan ()] 'Sustaining Agricultural Production in a Deregulated Economy'. E D Balogun , G O Evbuomwan . *Economic and Financial Review* 1993. (2) p. .
- [Nadiri and Mamuneas ()] *The Effects of Public Infrastructure and Capital on the Cost Structure and Performance of US Manufacturing Industries*, M I Nadiri , T P Mamuneas . 1994.
- [Jeager ()] *The Impact of Policy on African Agriculture: An Empirical Investigation African Development Bank*, G Jeager . 1990. Washington DC.
- [Moses ()] 'The Influence of Flood Regime on Fish Catch and Fish Communities of the ©2011 Global Journals Inc. (US) Cross River Flood Plain Ecosystem'. B S Moses . *Environmental Biology of Fishes* 1987. 18 (1) p. .
- [Ndebbio (ed.) ()] *The Nigerian Economy at the Crossroads: Policies and their Effectiveness*, J E U Ndebbio . Ekpo, A. H. and I. U. Ndebbio (ed.) 1991. Calabar: University of Calabar Press. p. . (Bureau de change, etc What Implications for the Nigeria Economy)
- [Kwanashie et al. ()] *The Nigerian Economy: Responses of Agriculture to Adjustment Policies*, M I Kwanashie , A Ajilima , Garba . 1998.
- [Leftwich ()] *The Price System and Resource Allocation. Holt, Rinehart and Winston*, R H Leftwich . 1996. 1970-2000. New York, Chicago, London. (Impact of Macroeconomic Policies on Capture Fishery in Nigeria)

-
- 473 [Moses (1989)] ‘The Status of Artisanal Fisheries and Fish Resource Conservation in South East Nigeria’. B S
474 Moses . *Inaugural Conference of the Nigeria Society for Biological*, (Uyo) 1989. 28-30 May 1989. Conservation
475 of the University of Cross River State
- 476 [Shepard ()] *Theory of Cost and Production Functions*, R Shepard . 1970. Princeton NJ: Princeton University
477 Press.
- 478 [Dhonte et al. ()] *Three Propositions on African Economic Growth IMF Paper on Policy Analysis and Assessment*
479 *PPAA/95/9*, P ; Dhonte , Imf , D C Washington . 1995.
- 480 [Okigbo (ed.) ()] *Understanding Africa’s Rural Household and Farming Systems*, B N Okigbo . Joyce, L. Moock
481 (ed.) 1986. Colorado: West View Press Inc.
- 482 [Essen ()] ‘Various Types of Canoe Fishery in Ikot Abasi’. A A Essen . *Proceedings of the 2 nd Annual Conference*
483 *of the Fishery Society of Nigeria (FISON)*, (the 2 nd Annual Conference of the Fishery Society of Nigeria
484 (FISON)Calabar) 1982. p. .