

# The Declining Contribution of Forestry to the Gross Domestic Product of Nigeria: Causes and Cure

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**Abstract** Forest ecosystems play multiple roles at global as well as local levels and provide a range of important economic, social and environmental goods and services that have impact on the well-being of the people. The objective of this paper is to assess the declining contribution of forestry to the Gross Domestic Product (GDP) of Nigeria and to proffer possible solution to the problem. Secondary data for the research were collected from the Central Bank of Nigeria from the period 1980-2004. Multiple regression analysis (exponential or transformed semi log) was used to determine the input factors that critically influence the Gross Domestic product in the agricultural sector of the country. The equation and figures revealed a high performance of the model in term of the high value of  $R^2$ . The high value of  $R^2$  implies that 98.7% percent variability in gross income generated from Agriculture is explained by combined effect of the independent variables (Crop production, Fishing, Forestry and Livestock). The level of significance of the explanatory variables is high. F-value is significant at both 1 percent and 5 percent. Individually, their contributions are not significant ( $P > 0.05$ ), but pulled together, it showed significant difference at  $P < 0.01$ . The result showed that the contribution of forestry sub-sector has been declining as GDP increases. Forestry has been a unique business in Nigeria even before independence. In 1958, forestry contribution to the GDP of the country was 6.1 %; in 1960, it was 5.3%. Surprisingly, the percentage contribution in 2003 is 0.6%. The declining export role of forest produce in the national economy is partly due to the over-exploitation of the high quality timbers in the previous decades and partly to the inability of the forest departments and the timber trade to develop the secondary species which now constitute the main timber contents of the forest estate. It is recommended that the new hectares of planted trees need not be in large expanse of lands, rather, the new forest lands might have to be in patches located in water shed areas, school compound, road sides, government institutions, community lands, and private properties.

**Keywords** Gross Domestic Product, Forest Establishment, Forestry Contribution

## 1. Introduction

Forest ecosystems play multiple roles at global as well as local levels and provide a range of important economic, social and environmental goods and services that have impact on the well being of poor rural communities, local and national economies and global environmental health. It is estimated that at the global level, forestry formerly contributes some 2 percent to world GDP or more than US600 billion per annum[1][2]. However, the actual contribution afforests to the world economy may be much higher, though extremely difficult to quantify. A 1997 study in the journal of Nature estimated the global value of goods and services that forest ecosystems provide from timber to climate regulation to water supply to recreation at some US \$ 4.7 trillion a year, or more than a quarter of that year's world GNP of US \$ 18 trillion[3][4]. As the state of the

world's forests 2003 report emphasizes, forests can help in important ways to reduce food security, alleviate poverty, improve the sustainability of agricultural production and enhance the environment in which many impoverished rural people live all over the developing world[5]. It is reported that Canada's forests are the backbone of an \$81.8-billion forest industry. Its forest products contributed almost \$30 billion to Canada's positive trade balance, added over \$33 billion to the gross domestic product (GDP), and generated \$3.3 billion in new capital investments. The total value of forest product exports reached \$39.6 billion and direct employment in the forest sector increased by approximately 14 900 person-years to 376 300 in 2003[6].

In Nigerian economy, Forestry is a lucrative business. For instance in 1960, the value of exported logs and processed timber exceeded N16.2 million and ranked as Nigeria's seventh most important group of export products. In 1963 and 1965, timber products maintained eight positions although in between, their total value was surpassed in 1964 by that of raw cotton and in 1965 by that of groundnut oil[7]. After the cessation of hostilities in January 1970, there was a fairly rapid recovery in the exports of petroleum, cocoa,

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palm kernels, groundnut produce, raw cotton, rubber, tin ore and metal, and by the end the year, logs, sawn wood and plywood valued at N8.0 million trailed behind these products as the ninth most important. Forestry has been a unique business in Nigeria even before independence. In 1958, forestry contribution to the GDP of the country was 6.1 %, in 1960, it was 5.3%[6]. Surprisingly, the percentage contribution is now less than 1 % [8]. This paper however, examines the declining contribution of forestry to the economy of Nigeria and the probable causes and solution to the problem.

## 2. Methodology

Secondary data were collected from the Central Bank of Nigeria from the period 1980-2004.

## 3. Data Analysis

### 3.1. Production Function Analysis for Forestry Contribution to Gross Domestic Product

Production function describes the mathematic relationship existing between the quantity of out and input or resources used. The need for production function analysis drives home the need to subject this technical relationship to economic analysis. This is borne basically by the use of economics, statistics and econometric principles. In model formulation, there is often a need to decide whether a single equation or system of equations is appropriate. In this vital decision making, consideration should be given to whether the explanatory variable or independent variables are exogenously or endogenously determined in relation to the production process. If the explanatory variables are exogenously determined, then a single equation is favoured. But if it is otherwise, a system of equation would best describe the production process. The study employed a single equation model to characterize the gross domestic product in the agricultural sector-because the explanatory variables are exogenously determined in relation to the production process. There are many algebraic forms of production functions. These include linear, square root,

quadratic, semi-log, double-log (cobb-douglas), exponential and their variant. The criteria for choosing a functional form should be based on the understanding of the method of production and ease of computation.

However, for the purpose of this study, exponential or transformed semi log was used, expressed as follows:

$$\text{Log } Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

..... equation i

Where Y (dependent variable) = Gross Domestic Product (N) ..... equation ii

$X_1$  = Value of Crops (N)

$X_2$  = Value of Livestock (N)

$X_3$  = Value of Forestry (N)

$X_4$  = Value of Fishing (N)

e = Error term

Y and  $X_1$ ,  $X_2$ ,  $X_3$ , and  $X_4$  data were obtained from the [8] statistical bulletin and CBN Annual report for the period 1980-2004.

## 4. Result and Discussion

### 4.1. Contribution to the Gross Domestic Product of Nigeria

Forestry is the fourth quadrant of the Nigerian four-part agricultural industry (crops, livestock, fisheries and forestry). Since agriculture contributes the largest share of the gross domestic product (GDP), every component of the industry is important in this contribution, albeit in varying degrees. The multiple regression analysis using the lead equation (Exponential or transformed semi-log) to explain the contribution of crops ( $x_1$ ), livestock ( $x_2$ ), forestry ( $x_3$ ) and fishery ( $x_4$ ) to the country's Gross Domestic Product is estimated as follows (table 1):

$$\text{Log } Y = 32447.14 + 1.10x_1 - 0.42x_2 - 0.10x_3 + 0.41x_4 \quad \text{..... equation iii}$$

With  $R^2 = 0.987$

$R^2$  (Coefficient of determination) = 0.984

S.e (Standard error) = 316879.37

F – value (Test statistics) = 347.361

**Table 1.** Functional Form

Functional form	Constant term	X1	X2	X3	X4	R2	R-	F. value	Sig.
Exponential or transformed semilog	32447.138 (0.241)	1.100 (1.244)	-0.423 (0.307)	-0.097 (0.913)	0.413	0.987	0.984	347.361	.000*

Figure in parenthesis are t-values

Coefficient is significant at 1 % and 5% level. R- Coefficient of determination. Se- Standard error. F- Test statistics

**Table 2.** Sectoral Output as a share of GDP (at 1962 prices)

Activity	1958	1959	1960	1961	1962	1963	1964	1965	1966
Sector	%	%	%	%	%	%	%	%	%
Crop Production	51.1	50.0	51.4	49.2	49.4	49.4	47.0	44.4	42.7
Livestock	6.2	6.1	5.6	5.7	5.4	5.2	5.5	5.1	5.1
Forestry	6.1	5.8	5.3	5.2	4.7	4.9	4.5	4.5	4.2
Fishing	2.1	2.0	1.7	1.7	1.6	1.5	2.3	2.4	3.0

Source: Annual Abstract of Statistics, 1968 Federal Office of Statistics, Lagos, Cited by [6]

**Table 3.** Gross Domestic Product at Current Basic Price (Naira Billion) Share of Total (%)

Activity	2000	2001	2002	2003	2004/1	2000	2001	2002	2003	2004/1
Sector										
Agriculture	1,192.91	1,594.89	1,883.25	2,136.47	2,578.97	26.3	34.0	34.9	30.8	31.20
(c)Crop Production	1,000.07	1,337.77	1,576.43	1,787.32	2,155.13	22.0	28.5	29.2	25.7	26.08
(b) livestock	116.39	154.50	183.20	202.26	243.89	2.6	3.3	3.4	2.9	2.95
(c)Forestry	22.44	27.46	33.19	40.42	51.66	0.5	0.6	0.6	0.6	0.63
(d) Fishing	54.01	75.17	90.43	106.47	128.29	1.2	1.6	1.7	1.5	1.55

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Source: CBN Annual Report and Statement of Account (2004)

The above equation and figures revealed a high performance of this model in term of the high value of  $R^2$ . The high value of  $R^2$  implies that 98.7% percent variability in gross income generated from Agriculture is explained by combined effect of the independent variables. Also, the level of significance of the explanatory variables is high since F-value is significant at both 1 percent and 5 percent. Individually, their contributions are not significant ( $P > 0.05$ ), but pulled together, it shows significant difference at  $P < 0.01$ . The result also shows that the contribution of forestry sub-sector has been declining as GDP increases as shown in the lead equation. Table 2 reveals that Forestry sectors contribution to the GDP ranges from 0.5- 0.63) form year 2000 to 2004 although very little compare with the whole Agricultural sector which ranges from 26.3-34.9% in the same year. The performance of forestry in GDP contribution contrasts sharply with the rising profile of resource extraction from the sub-sector and as a major revenue generation in the Ministry of Agriculture, and other Ministries where they are located. This problem may not have been unconnected with lack of transparency, accountability and high level of corruption that had eaten deep into the fabric of the sub-sector[9].

The declining export role of forest produce in the national economy is partly due to the over- exploitation of the high quality timbers in the previous decades and partly to the inability of the forest departments and the timber trade to develop the secondary species which now constitute the main timber contents of the forest estate. The diversification of the international marketing of Nigerian forest products must be through quality upgrading and the introduction of lesser – known species and new products in order to penetrate new markets in addition to increasing the value of exchange earnings from old markets. Forestry sectoral output as represented in tables 2 and 3 are under estimated of its contribution to the GDP. Timber is the only forest product accorded statistical recognition in the National Accounts although equally pertinent forest commodities abound. It would be erroneous, therefore, to conclude from these data that forestry is a negligible economic sector. The economic importance of forestry is not solely dependent on timber exploitation for export or for home consumption: There are states in which forests represent a valuable commercial asset. Yet, in other places, forests have little such value and their crucial role lies in the protection they can afford to the sources of water or in their influence on climatic conditions,

both of which are matters of importance to the well being of millions of Nigeria.

An important benefit that is often overlooked is the continuing use of the infrastructure, which was built primarily for the growth of the timber economy. Examples of these are the present road network, railway tracks and waterways originally constructed for timber exploitation[7].

## 5. Conclusions

Forest policy implementations have been reactive, falling behind the broader social and economic changes. To be in the forefront of changes requires a more proactive approach. This would necessitate substantial effort to understand the future direction of social and economic development, and identifying the appropriate role the sector could play. Making the policies relevant at all times is thus a major challenge that the sector has to confront and this will require intense interaction with other sectors. It is now crucial to have forward-looking policies anticipating economic, social and environmental changes to guide the development of the forest sector[10]. With a high rate of multiplier effects the potentiality of forestry as a source of employment, foreign exchange earnings and as an investment proposition is tremendous. These considerations therefore justify the demand that the modernization of forestry be given due priority in concerted national development efforts.

## 6. Recommendations

The recommendation in this paper should be implemented soon, if the ongoing deforestation, forest depletion and degradation are to be curbed. Failure in this regard will exacerbate the economic, social and environmental problems already plaguing the forest resources. According to [10], the total area under forest reserve in Nigeria is 6%. Therefore:

- the new hectares need not be in large expanse of lands, as of old, rather, the new forest lands might have to be in patches located in water shed areas, school compound, road sides, government institutions, community lands, and private properties.

- reforming laws and regulations will have limited impact unless one also reforms the institutions in charged with implementing them. These institutions must have to become more efficient, outcome oriented, less corrupt and more

transparent for any meaningful development to take place in forestry.

- the widespread violation of existing forest laws and regulation has major negative impacts on forests, livelihoods, revenue generation and the rule of law. Something must be done about that.
- the present practice of accepting forestry as public venture is not ideal. The private firms and industries that derived their raw materials from the forest should be made to pay back some of their huge profits to forest regeneration programmes. It is recommended that 25% of the gross profit should be backwardly integrated towards forest regeneration or re-forestation.

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