

## ECONOMIC ANALYSIS OF TAMARINDS PRODUCTION IN KANO STATE, NIGERIA

ammed, D. (dauda\_mhmd@yahoo.com) and \*\* Ndanitsa, M.A. (attahirundanitsa@yahoo.com)  
ry Research Institute of Nigeria, North – East Arid Zone Research Station, Damasak/Maiduguri, Nigeria.  
partment of Agricultural Economics and Extension Technology, Federal University of Technology, Minna,  
Nigeria.

### ABSTRACT

Study examined the profitability of Tamarind production in Kano State of Nigeria. Data were collected through structured questionnaires with oral interview among 150 respondents, in four tamarind production areas in the state. The data were analyzed using descriptive and inferential statistics. The results indicated that majority of the respondents (47.33%) were civil servants who were mostly teachers and 70.66% had small farm size of 1 – 4 hectares scattered in different plots that were relatively far apart. The profitability analysis revealed that N6,273,493.40 was realized as total revenue and the gross margin (GM) was N1,986.85 which give GM/ha/year of N7,091.42. Similarly, the mean profit per respondent was N27,401.13. The analysis of revenue distribution among the respondents determined by Gini Coefficient (GC) also showed that there was high level of revenue equality distribution among tamarind farmers (GC=0.35). The study identified constraints of tamarind production and made recommendation to overcome them.

### KEYWORDS

Tamarinds (*Tamarindus indica*), profitability, Gini coefficient, budgetary technique.

### INTRODUCTION

Agriculture has been defined as the production of food and the domestication of farm animals for the mutual benefit of mankind; i.e. it is the act of establishing an output relationship of a farm resource with a view of maximizing profit and/or reducing cost (Hill and Ray, 1987). Agriculture also includes the activities of forestry management and aquaculture (Ndanitsa, 2006). This means that agriculture for majority of Nigerians is more than a profession of land tillage and animal rearing, but a way of life.

Nigeria is predominantly an agricultural country with estimated 98.3million hectares of land of which about 75 percent is arable, and an estimated human population of about 150million (World Bank, 1996). The country is known as an agrarian economy since 1953 when the World Bank sent its first mission to study the country's basic economy. In the past, there were various schemes on agricultural development by Federal Government through farm settlement schemes, introduction of improved farm implements, cooperative extension and expanded agricultural extension services. The plan improved agricultural sector in the economy, as available data showed that the contribution of agriculture to Gross Domestic Product (GDP) was 61 percents, employs about 60 percent of labour force, accounts for over 70 percent of the non-oil exports and provides over 80 percent of food needs of the country. Therefore, agriculture is one of the most important sectors of notable relevance in economic development and growth.

The advent of oil boom led to a drift of human and financial resources from the agricultural sector,

thereby marginalizing it. According to Oyedipe (2001), the discovery of oil and the distracted government attention for agriculture consequently led to decline of the contribution of the sector to GDP from 61 percent to only 7 percent in the 1980s, and that growth of output of the sector (in real terms) has not been sustained during any two consecutive years for almost a decade prior to the introductions of the adjustment programme. The repercussion of the neglect shown to agriculture laid down to roots for poverty, laziness, dependence and accelerated corruption in the country, and this is responsible for the classification of Nigeria as the thirteenth (13<sup>th</sup>) poorest country in the world. Similarly, there was also an instant imbalance between population growth rate and food production in the country as statistical report indicated that population growth rate was 3.2% while food production growth rate and food demand growth rate was 1.2% and 3.2% respectively since 1980 (Enwere, 1991). The Federal Office of Statistics (FOS) and the United Nations (UN) also reported the implication of the decline in agricultural production, that by 1960, poverty condition in Nigeria was 22% but in 1995, it increased to 35% and to 45% in 1991. By 1996, the poverty incidence was 50% and quickly rises to about 80% in 1998 (Oyedipe, 2001). It is against this background that one fear for Nigeria, having failed to use its oil proceeds to develop agriculture. Nigeria's position in the twenty – first (21<sup>st</sup>) century will not depend on its oil but the development of its agricultural sector (including forest and other natural resources).

Economic growth has gone hand in hand with agricultural progress; stagnation in the agricultural progress is the principal explanation for poor

economic performance, while rising agricultural productivity has been the most important concomitant of successful industrialization, food security and self-sufficiency (World Bank, 1992). Mabawonku (1986) revealed that the declining productive capacity of the agricultural sector during 1980s and 1990s, consequent of the economic deregulation (introduction of the structural adjustment programme, SAP) explain to a large extent the poor performance of the Nigerian economy. This available evidence suggests that macro-economic and sectoral policies initiated during the last two decades in most parts of the country were largely responsible for the deterioration of the agricultural sector (Oyedipe, 2001). The situation became alarming which drew government attention to her policies and programmes reform on agriculture. The new policies, tagged "Vision 2010" "food sufficiency and poverty alleviation" involved identification of some agricultural crops for elaborate production and marketing. Some of these crops are oil palm, natural rubbers, cocoa, tamarinds, cassava, rice, cotton, cashew, maize, shea nuts, and groundnuts. The objectives of the study therefore are to examine the economics of Tamarinds (*Tamarindus indica*) in Kano State, and to evaluate the socio-economic impact of the crop on the respondents.

Agricultural production refers to the utilization of inputs to produce the desired outputs, with the aim of maximizing profit and minimizing the cost of its production (Hill and Ray, 1987). Similarly, the production of a particular agricultural commodity is a function of its market demand, which is influenced by set of measures taken by central government on agricultural production and marketing, hence affects the socio-economic, political and physical characters of the citizenry (Umar *et al*, 2006).

Tamarinds (*Tamarindus indica*) is a desert thriving plant. They are tropical trees and shrubs, and are rarely herbs. In Hausa language, they are called *Tsamian*, while Nupe called it *Dara*. The fruit type is a pod. Tamarinds are used in the preparasite of palp and as medicinal for the treatment of strains and bruises. Generally, there are so many species of tamarinds found in sub-saharan Africa and are found grown wild in Northern Nigeria, where the climatic condition are favourable for the plant's growth (Umar, 2006). In Nigeria, tamarinds are found in states like Jigawa, Niger, Yobe, Borno, Kebbi, Kaduna, Sokoto, Katsina, Taraba, some parts of Kwara states. Kano was purposively selected for the studies due to her elaborate production scheme on Tamarinds. Due to the economic significance of this project worldwide, it happens to be one of the major export crop in some African countries like Sudan, Egypt, Mali, Chad,

Burkina Faso, Niger Republic, while Nigeria also earns some reasonable foreign exchange from Tamarinds export (Mohammed, 2010). The study therefore, examines the economic and prospects of tamarinds production in Kano State of Nigeria.

## METHODOLOGY

The Study Area: Kano state is located in the north west of Nigeria, between latitude 12°N and longitude 8°31'E. The State lies within the Sudan and Sahel zones except some parts of the state that fall into the Northern Guinea Savannah. The state is the second most populous state in the country with population of 9,401,288 people (NPC, 2009). Annual rainfall ranges from 638 to 889mm. In December, the temperature could be low as 10°C but the mean daily minimum temperature is between 15.86° and 33.1°C. Kano is the commercial city of Northern Nigeria and with many industrial establishment. This indicates availability of markets for both agricultural and forestry products in the state. The dominant tribes are Hausa and Fulani. Their major occupations are farming and trading. Among the popular cash crops grown and traded in the state include tamarinds, gum arabic, groundnut, onion, cotton, tomatoes and pepper. Other crops commonly cultivated in the state include millet, Guinea corn, maize, rice, beans and sesame.

Data Collection and Sampling Technique: A multistage sampling technique was used in the data collection. The first stage was a purposive sampling of four (4) predominantly tamarinds production areas in the state, namely Kura, Dawakin Kudu, Bagasawa and Wudil; while the second stage was a random sampling of tamarind farmers in these areas for administering of questionnaires and oral interviews. In all, a total of 200 copies of questionnaire were administered among farmers. However, at the end of the interview, 150 questionnaire were correctly filled, collected and found usable for the analysis of this study. Data were collected between November, 2009 and April, 2010.

Analytical Techniques: The data were analyzed using descriptive and inferential statistics. The descriptive statistics such as means, percentages, tables and frequency tables were used to analyze the socio economic characteristics of the respondents; while inferential statistics such as budgetary analysis and Gini-coefficient were employed to analyze the profitability of tamarinds production in the state.

## Model Specification

(i) Budgetary/Profitability Analysis: This is expressed as:

(a)  $GM = TR - TVC$  -----  
 1  
 Where: GM = Gross Margin in Naira (₦)  
 TR = Total Revenue in Naira(₦)  
 TVC = Total Variable cost in Naira(₦)  
 (b)  $NP = TR - TC$  -----  
 2  
 Where: NP = Net Profit in Naira(₦)  
 TR = Total Revenue in Naira (₦)  
 TCV = Total Cost in Naira (₦)

li: Gini – Coefficient: The expression is as thus:  $GC = 1 - \sum XY$   
 Where: GC = Gini Coefficient,  
 X = Percentage of producers in the category  
 Y = Cummulative proportion of total production and  $\sum$  = summation sign.

**RESULTS AND DISCUSSION**

Table 1: Socio – economic characteristics of respondents

Age Distribution:

Characteristic (variable)	Frequency	Percentage
10 – 22 years	12	8.00
21 – 30 years	62	41.33
31 – 40 years	47	31.33
41 – 50 years	24	16.00
51 – 60 years	05	3.34
Total	150	100.00
Occupational Distribution		
Farming only	35	23.33
Trading Business	37	24.66
Civil Servants/Teachers	71	47.33
Others	07	4.66
Total	150	100.00
Farm Size (ha)		
1 – 4.99	106	70.66
5 – 8.99	19	12.66
9 – 12.99	11	7.33
13 and above	14	9.32
Total	150	100.00
Marital Status		
Single	21	14.00
Married	121	80.67
Divorced	01	0.67
Widower	07	4.67
Total	150	100.00
Characteristics (Variable)		
Highest Educational Level		
Adult Education	61	40.67
Qur’anic Education	75	50.00
Primary Education	10	6.67
Secondary Education	03	2.00

Tertiary Education	01	0.67
Total	150	100
Family size of respondents		
1 – 5	37	24.67
6 – 10	89	59.00
11-15	12	8.00
16 – 20	10	6.67
21-25	02	1.33
Total	150	100

Source: Field survey, 2009/2010

Table 1 shows the socio-economic characteristics of respondents in the study area. The socio-economic characteristics studied include age distribution, occupational distribution, farm size, marital status, educational level attained and family size of respondents. The table reveals that 41.33% of farmers were within the age brackets of 21-30 years, 31.33% were within the age brackets of 31 – 40 years while the least were those within the age brackets of 51 – 60years (3.34%). This implies that most of the Tamarind farmers in the study areas were in their active stage and their productivity is expected to be high.

The occupational distribution of the respondents is also presented in table 1. The result revealed that majority of the respondents (43.77%) were either civil servants or teachers (of Qur’anic education). This was followed by those who combined farming with trading (24.66%), while 23.33% claimed to be fulltime farmers. This indicates that Tamarinds business was mostly done by civil servants/teachers in the state. This implies that the civil servants have access to tamarind production packages more than the non-civil servants in the state. In terms of farm size, table 1 reveals that majority of the tamarind farmers in the area (70.66%) have 1 – 4.99ha of tamarind farms scattered in different plots. Only 9.32% of the farmers have 13ha and above of tamarind farm in the state. This is an indication that tamarinds production in the state is in the hands of small holder farmers. This may be due to lack of available land and fund to establish large scale farms of tamarinds or due to tenancy arrangement which does not encourage the establishment of tree crop plantation. Furthermore, table 1 also shows the marital status of respondents in the study areas. Most of them (80.67%) were married couples while the remaining were either single (14.00%) or divorced (0.67%) or widower (4.67%). This implies that the farmers may have readily supply of family labour to work on their farms especially when the children are available to work on the farm which may translates to increase in the size of land cultivated. Marital status also determines the status of respondents towards their household responsibilities (Ndanitsa, 2009).

Education determines the quality of skills of the farmers, their allocative abilities and how well informed of the innovations and technology around him. Roger and Shoemaker (1971) and Obibuaku (1983) stated that education is not only an important determinant of adoption of innovation but also a tool for successful implementation of innovation. Table 1 revealed the educational status of respondents. It shows that most of the farmers of tamarind (50.00%) have access to only Qur'anic education. In general, only 9.34% had formal education (primary, secondary or tertiary), this however, has implication on the adoption of innovations. This findings corroborates with the findings of Tsoho (2005) and Ndanitsa (2005).

Table 1 also shows the family size of respondent in the study are. Most of the farmers had family size of between 6 – 10 members (59.33%), which is an indication of large family labour to work on the farms and save the farmer from the cost of having to acquire the services of hired labour.

Table 2: Budgetary/Profitability Analysis  
Variables Amount (Values in N)

Total hectares	689 hectares
Quantity of Tamarinds	168,400kg
Produced/Sold	
Fixed Cost (FC)	N775,817.00
Total Variable Cost (TVC)	N1,387,506.40
Total Cost (TC)	N2,163,323.40
Total Revenue (TR)	N6,273,493.25
Gross Margin (GM)	N4,885,986.85
Gross Margin /ha/ year	N7,091.42
Net Profit (NP)	N4,110,169.85
Net Profit/Farmer	N27,401.13

Source: Data analysis, 2009/2010

Gross Margin (GM) of budgetary analysis model was used to determine the profitability of tamarinds production in the study area. The result of the analysis is presented in table 2. The result revealed that GM obtained was N4,885,986.85. Similarly, GM/ha/yr was N7,091.42. Total net profit was calculated as N4,110,169.85, which gives an average of N27,401.13 per respondent. This implies that tamarind production in the state is profitable.

Table 3: Analysis of Revenue Distribution

Sale (N)	No. of Farmers	Prop. Of farmers (x)	Cum. Prop. Of farmers	Total Revenue (N)	Prop. On total Revenue	Cum. Prop. On total revenue (v)	XY
1 – 200,000	94	0.627	0.627	892400	0.14	0.14	0.088
200,001 – 400,000	26	0.173	0.8	1237600	0.2	0.34	0.059
400,001 – 600,000	10	0.067	0.867	2183900	0.35	0.69	0.046
600,001-800,000	8	0.053	0.92	1876400	0.3	0.99	0.052
Above 800.00	12	0.08	1	83193.25	0.01	1	0.08
	150	1	-	6273493	1	-	0.325

Source: Data analysis, 2010

$$GC = 1 - 2xy$$

$$= 1 - 0.65$$

$$= 0.35$$

Table 3 shows the analysis of revenue distribution among tamarind farmers in Kano State. Gini coefficient model ( $GC = 1 - \sum XY$ ) was used to determine the revenue distribution among the respondents in the state. The revenue generated among the farmers ranged from N2,120.00 to N1,420,000.00. These were grouped into five categories in order to determine the revenue distribution among the respondents. The respondents within the sales range of N1.00 – N200,000.00 formed the first category and they constituted about 63% of the total respondents which accounted for only 14.225 of the total revenue generated. The sales category of N200,

001 – N400,000.00 were 17.33% and they accounted for about 19.73% of the total revenue generated while the sales category of those within the range of N400,001 – N600,000.00 was only 6.67% which generated a total revenue of 34.81%. It was also indicated that 5.33% of the respondents formed the sales category of N600,001-N800,000.00 which generated a revenue of N29.91% of the total revenue. Those with sales range of great than N800,000.00 constituted 8.00% of the total respondents, and they generated about 1.33% of the total revenue. Furthermore, using the Gini coefficient (GC) formular; GC was calculated as 0.35, which is quite far from unity; 1 (table 3).

this implies that there was high level of revenue equality in the revenue distribution among the farmers of tamarinds in the state.

Table 4: Tamarinds Production Constraints

Characteristics constraints (Variables)	Frequency	Percentage
Lack of land/land tenure	20	13.33
Lack of improved seedlings	08	5.33
Lack of technical know-how	23	15.33
Poor yield	17	11.33
Poor market for product	12	8.00
Lack of government support	06	4.00
Inadequate capital	27	18.00
Problems of pest and diseases	06	4.00
Problems of fire disaster/bush burning	07	4.67
Non-accessible road/transportation problem	14	9.33
Conflicts with arable farmers	10	6.67

Source: field survey, 2009/2010

The composition of the list of constraints that limit the production of tamarinds by the farmers in the study areas is revealed in table 4. There were eleven (11) factors identified as constraints hindering the respondents' maximum production capacity of tamarinds in the state. These includes inadequate capital (18.00%) lack of technical know-how (15.33%), Poor Yield of production (11.33%), conflicts with arable crop farmers (6.67%), poor market for product (8.00%), lack of improved seeds/seedlings (5.33%), problem of pests and disease infestation (4.00%) and lack of government support (4.00%). This implies that for tamarinds production to expand in the state, soft loans should be provided to the farmers and the extension agents should establish stronger contact with the farmers through enlightenment campaigns and demonstration plots on tamarinds production techniques among others.

#### CONCLUSIONS AND RECOMMENDATION

This study indicated that Tamarinds (*Tamarindus indica*) is a money thriving crop enterprise. It can serve as a very good source of income and employment as well as poverty alleviation among farmers in the state, especially when the identified constraints are adequately addressed. Similarly, more awareness campaign should be extended to its producers and the general public to encourage its

producers and the general public to encourage its production in the state. In terms of recommendation, tamarinds is a promising plant that is highly resistant to harsh climatic conditions, has high coppicing ability when cut or set ablaze and has high economic value. Government and other non-governmental organization need to encourage the tamarind farmers to maximize their production capacity by providing them with soft loans and some inputs like fertilizers, a source of irrigation water for nursing establishment, address the problem of conflicts with arable crop farmers, provide infrastructure especially access roads, price support services, protective land legislation and enforcement of legislations against bush burning and illegal felling of trees in the area. This will aid in economic empowerment of the farmers in the state.

#### REFERENCE

- Enwere, D. (1991). Economic transformation in Nigeria Ahmadu Bello University Press, Zaria.
- Hill, B. and Ray, D. (1987). *Economics of Agriculture, Food and Rural Economy*. Macmillan Education Limited.
- Mabawonku, A.F. (1986) "Fishing efforts and earnings in the Nigerian Artisanal Fisheries". *Journal of Rural Economics and Development*, 12 (2): 29-38.
- Mohammed, D. (2010). Pod characteristics and early growth of *Tamarindus indica* in Savannah zones of Nigeria M.Sc. thesis submitted to the Department of Forestry and Fisheries, Faculty of Agriculture, Usmanu Danfodiyo University, Sokoto Nigeria (Unpublished).
- National Population Commission, N.P.C. (2009) Provisional Census 2006 figure. National Population Commission/Federal Government of Nigeria (FGN).
- Ndanitsa, M.A. (2005) "Economics of Fadama Crop Production in Niger State of Nigeria. Unpublished M.Sc. Thesis, Department of Agricultural Economics and Farm Management, Faculty of Agriculture, University of Ilorin, Ilorin Nigeria.
- Ndanitsa, M.A. (2006). Training of Trainers (TOT) programs for farmers in Niger State. Credit/Group/Marketing Training) held at U.K.Bello Art Theatre, Minna, Niger State. 27<sup>th</sup> – 30<sup>th</sup> September, 2006. 33pp.
- Ndanitsa, M.A. (2009). Impact of small-scale irrigation technologies on crop production by Fadama users in Niger State. *Journal of Science, Education and Technology*, Vol. (2) Number 1, Pp. 122-132.
- Obibuaku, L.O. (1983). "The Nigeria Extension Services An Assessment". A Commissioned National Research Report.

- Department of Agriculture and Rural Development, N.I.S.E. Ibadan, 1983.
- Oyedipe, E.O. (2001). Agricultural Research Policy and National Development. Paper presented at the in-house technical workshop for the Agricultural Research Institutes on the Agricultural Policy: Abuja (10-04-2001).
- Rogers, E.M. and Shoemaker, P.C. (1971). *Diffusion of Innovations*. The Free Press of Glencoe, N.Y. Pp. 367.
- Tsoho, B.A. (2005). "Economics of Tomato-based cropping systems under small-scale irrigation in Sokoto State, Nigeria" Unpublished M.Sc. Thesis, Department of Agricultural Economics and Farm Management, Faculty of Agriculture, University of Ilorin, Ilorin, Nigeria.
- Umar, H. (2006). Economic Analysis of Gum-Arabic Marketing in Nigeria (A case study of Borno State). A master thesis, department of Agriculture Economics and Extension, School of Agriculture and Agricultural Technology, Federal University of Technology, Akure, Nigeria.
- Umar H.Y., Waizah, Y., Giroh, D.Y., Agbonkolor, N. and Mohammed, Y.Y. (2008). Economic Analysis of Gum-Arabic Production in Jigawa State Nigeria. Proceedings of the 10<sup>th</sup> Annual National Conference of National Association of Agricultural Economists (NAAE), 7<sup>th</sup> – 10<sup>th</sup> October 2008 Pp. 336 – 341.
- World Bank (1992). A Strategy to Develop Agriculture in Sub-Saharan Africa and focus for World Bank African Region, Washington, D.C., U.S.A
- World Bank (1996): Nigeria: "Poverty in the midst of plenty, the challenge of growth with illusion report number 14733, UNI, World Bank, Washington, D.C., U.S.A.