

Economic evaluation of trade in eru (*Gnetum sp*) Weld in the Manyu Division of the southwest province of Cameroon

L. Popoola, B.O. Agbeja, S.B. Besong

Department of Forest Resources Management, University of Ibadan, Nigeria

Abstract

This study evaluates trade in Eru (*Gnetum africanum*) in the Manyu Division of Southwest Cameroon with a view to appraising its national and international importance, profitability and problems militating against the trade. The objectives of the study are to determine the rate of return on investment of Eru; to determine the gross profit and to determine the relationship among the variables involved in Eru trade. The Rate of Return on Investment was between 44.1 percent and 70.8 percent while the gross profit ranged from 82,685 FCFA (₦ 14,380) to 143,537 FCFA (₦24,962.96) in a single transaction at 95 percent confidence interval. There was a weak correlation between amount purchased and taxes ($r = 0.348$). The amount purchased and transport also had weak correlation ($r = 0.479$). It is recommended that there should be a nationwide domestication programme for *Gnetum sp* to be complemented by increase in taxes and trade barriers to encourage sustainable exploitation; studies should be encouraged to identifying the best conditions for transporting the produce between markets. Improvement in the road network in Manyu Division should be considered to reduce length of time to reach the market and invariably cost of production.

Exchange rate of Cameroon FCFA to Nigerian Naira (₦) Currency
5.75 FCFA = ₦ 1

Introduction

Biological description

The *Gnetum africanum* (ERU) plant has two distinguishable species, *Gnetum africanum* Weld and *Gnetum buchholzianum* Engl both in the family Gnetaceae. It is a vine with opposite simple leaves with conspicuous veins (FWTA, 1974). The flowers are catkin like spike and the seed has a copious endosperm which becomes brown when mature. The two species are found growing in South eastern Nigeria, Gabon, Cameroon, Congo, Zaire and Angola (Nkefor *et al.*, 1994). The leaves of this vegetable are known to have nutritional value. Ailoundama (1985) concluded that the leaves contain eight essential amino acids in large quantities. Its consumption can therefore assist in the fight against protein deficiency, especially in rural area when other sources of protein (meat and fish) are unaffordable to many people. *Gnetum africanum* also has some medicinal values. In

Nigeria, the leaves are used for treatment of enlarged spleen, sore throat and as a cathartic or as treatment against nausea and in Ubangi, Cameroon as an antidote against arrow poison. In Congo Brazzaville, the stem is used to ease child delivery (Nkefor, 1997).

Importance

Originally, eru was eaten as a forest food by the Bayangi people living around the Mamfe and Cross River Region of Nigeria (Shiembo, 1995). As human population increases coupled with the increasing awareness on the palatability and nutritional value of this forest vegetable, its consumption gradually increased. This awareness was intensified in 1998 during the nationwide television programme 'cooking time' where

practical methods on its preparation were made public.

Trade in *eru* started somehow slowly mainly within the main tribes where it is a traditional delicacy like the Bayangi in the Southwest Cameroon and Cross River in the Southern Nigeria. In the early days, the trade was not really lucrative since the number of consumers was limited and the stock in the wild was abundant, making it easy for most consumers, especially in the rural areas to personally harvest the needed vegetable from the wild. In the 1980s, the trade in *eru* had not only gained national importance but extended internationally. A market survey carried out by MINEF in 1994 revealed that 5,296.415 tons of *Gnetum africanum* was exported between 1985 and 1994 through the Idenau outlet to Nigeria.

According to Nkefor (1997), the market prices per kilogram were also known to vary with markets. In Cameroon, Nigeria, Britain and USA, the prices were 400FCFA, 4000 FCFA, 8000 FCFA and 30,000FCFA respectively.

As the demand for this produce increases, the pressure on the resource base is known to increase and coupled with the unsustainable harvesting method by some collectors (e.g. cutting entire vines instead of leaves) the sustainability of this resource is threatened. In a survey of NTFPs in the Takamanda Forest Reserve, Cameroon, *eru* was observed to have a restricted distribution (found mainly in the lowland rainforest). Unsustainable methods of collection (like cutting vines and tree supports) are contributing negatively to the improvement of the resource base (Sunderland and Besong, 2002). Presently, harvesting of this produce is concentrated around Yaounde for exportation.

An important feature of this trade is its dominance by women (both during harvesting and sales), reason for which the forestry law assigns a low tax (10FCFA per bundle) as a means of supporting women income. With the dwindling supplies from the wild occasioned by exorbitant prices, there is need to supplement the wild stock if the availability of this cherished forest vegetable is to be guaranteed. This has given rise to idea of domestication of this wild plant.

An evaluation of trade in this important species was carried out to appraise the channels, problems and constraints as well as the relationships between independent variables like transport cost, forestry taxes, sale price per bundle, etc. and the dependent variable like profit to enable an inference on the contributive effects of the various variables on net revenue. Also considered were the factors militating against the trade and the sustainability of the resource base.

Methodology

The study was carried out in the Manyu Division of the Southwest Province of Cameroon. The tool used for collection of data was questionnaire. The total number of people involved in this trade and their distribution within the Division is not certain. As a result, purposive sampling technique was adopted in the selection of respondents on the condition that the trader was a bulk purchaser. A total of 27 bulk purchasers were sampled. However, effort was made to ensure representation of all subdivisions in the Division. Data were collected by means of semi-structured questionnaire and personal interviews. General information on the trade, taxes, capital involvement and problems associated with the trade were documented.

Data analysis

Three indices of profitability were considered. They include Gross Profit (GP), Benefit-Cost analysis, and Rate of Return on Investment (RORI).

$$\text{Gross Profit (GP)} = \text{GR} - \text{VC}$$

$$\text{Rate of Return (ROR)} = \text{TR} / \text{TC} \times 100$$

$$\text{Rate of Return on Investment (RORI)} = \frac{\text{TR} - \text{TC}}{\text{TC}} \times 100$$

Where

GR = Gross Revenue

VC = Variable Cost

TR = Total Revenue

TC = Total Cost

Cost associated with infrastructure like buildings were not included in the analysis to avoid ambiguity. It was realized that most traders do not

own specific stores set aside purposely for trade in *eru*. It was also difficult to obtain the effective labour needs of a single transaction as some traders reported to have up to three weeks in between transactions mainly for purchase due to scarcity of the produce. Most of the analyses were based on available costs from purchase of sales with attention on bulk purchase (Figure 1).

Correlation analysis was used to verify the relationship between the dependent variable which is gross profit and the independent variables which are transport cost, forest taxes, unit sales price of product, etc. Four models were fitted. They are linear, exponential, double-log and semi-log for predicting the dependent variable from the independent variables. Based on the R^2 values and Standard Error, the best fit was selected.

The models took the following constituents:

$$Y = A + X_1 + X_2 + X_3 + X_4 \dots\dots\dots 1$$

$$IN Y = A + X_1 + X_2 + X_3 + X_4 \dots\dots\dots 2$$

$$IN Y = A + IN X_1 + IN X_2 + IN X_3 + IN X_4 \dots\dots\dots 3$$

$$Y = A + IN X_1 + IN X_2 + IN X_3 + IN X_4 \dots\dots\dots 4$$

Where

Y = Gross profit

A = Coefficient

X_1 = Amount purchased

X_2 = Taxes

X_3 = Transport cost

X_4 = Unit /sales price

Results

Organization of trade

Gnetum africanum trade operates in two dimensions as described by the harvesters. Some quantity of what is harvested is available for local consumption through retailers while the bulk of the produce is passed on to wholesalers through bulk purchasers (Figure 1). Sales of *eru* through the former arrangement hardly attracts taxes and the transport cost is less while sales through the latter arrangement attracts taxes, high transport cost and other expenses though it is believed to be more profitable.

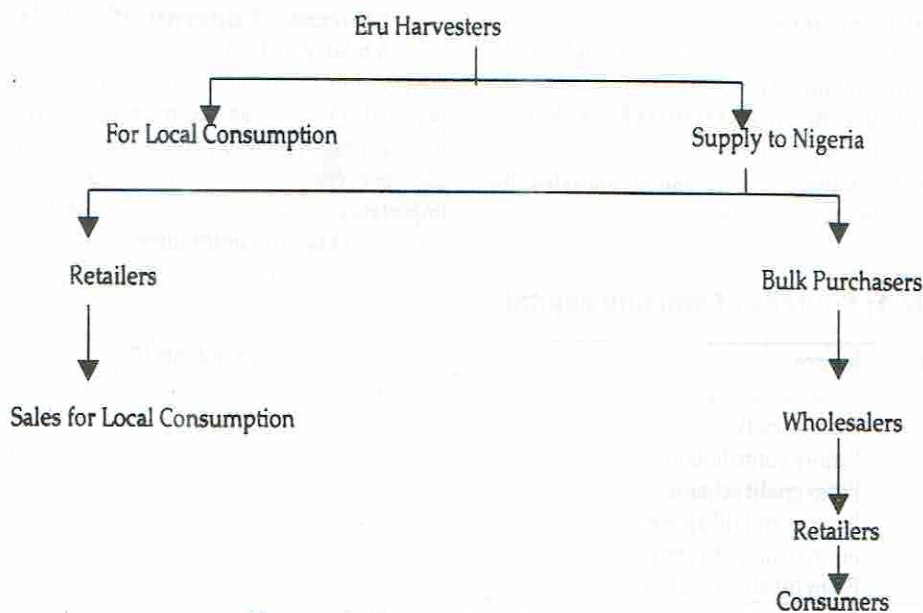


Figure 1: Eru trade channel

All the respondents sold their produce in Nigerian markets namely Ikom, Aba and Abuja. Popoola and Oluwalana (1998) identified levels of concentration in NTFP marketing which are directly applicable to the eru trade.

Assembly of produce by the bulk purchasers and retailers is done through all the levels from the

harvesters to the concentration point. The choice of the final concentration point is dependent on factors like accessibility to roads, security of produce as well as the volume of produce obtained in close proximity to the chosen point. The bulk of transport costs, taxes and other levies are incurred in stage 3 (Figure 2).

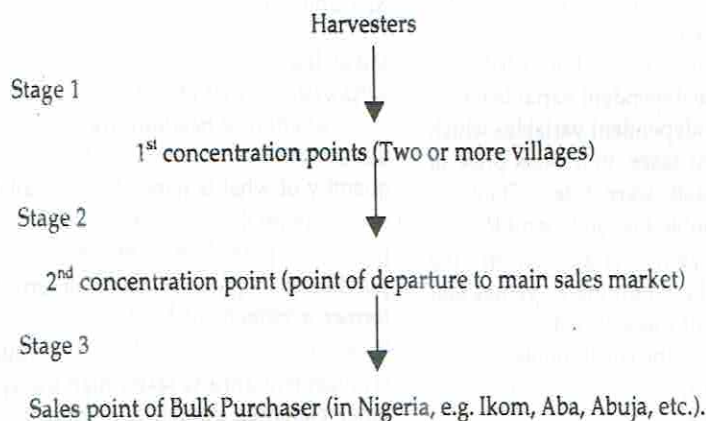


Figure 2: Generalized model for assemblage of eru by the bulk purchaser (Adapted from Popoola and Oluwalana, 1998)

Capital Resources

Eru trade does not require very high capital outlay. The liquid capital required to start the business falls between 45,000-80,000FCFA (₦7830 - ₦13,920) Also required are packing bags, sewing ropes and needles. No respondent indicated the need for warehouse or store.

Sources of operational funds

A total of 27 bulk purchasers were sampled in the Division. From Table 1 above, the importance of personal SAVINGS as the main source of starting the business (40.7% of respondents) is clear, while 25.9 per cent of the respondents revealed the importance of joint contributions from personal savings and family contributions.

Table 1: Sources of starting capital

S/N	Source	Respondents (%)
i	Personal savings	40.7
ii	From society	3.7
iii	Family contribution	7.4
iv	From credit scheme	3.7
vi	From(i) and (ii) above	25.9
vi	From (i) and (iii) above	14.8
vii	From (ii) and (iii) above	3.7
Total		99.9

Source: Field survey, 2002.

Trade performance

The Rate of Return on Investment was found to fall between 44.4% and 70.8%, while gross profit ranged from 82,685 FCFA (₦ 14,387) to 143,537 FCFA

(₦ 24,975) per single transaction at 95% confidence interval (Table 2).

Table 2: Structure and profitability per transaction

Description	Range*	Mean
Amount of eru purchased (FCFA)	114,330 – 157,930	136,130
Taxes (FCFA)	7,325 – 12,945	10,135
Transport and miscellaneous cost (FCFA)	33,836 – 47,800	40,818
Unit sales price (FCFA)	260 – 297	279
Unit purchase price (FCFA)	121 – 136	129
Gross Profit (FCFA)	82,685 – 143,537	101,088
Rate of Return (ROR) %	139 – 1,699	154
Rate of Return on Investment (RORI) %	44.4 – 70.8	57.6

Source: Field survey, 2002.

*At 95% Confidence Intervals

Gender involvement in eru trade

Women make up of 74% of the traders while the remaining 26% are men. The respondent traders had been involved in the trade for 0.3 to 15 years. Trade in eru is therefore clearly a female dominated activity.

Profit prediction

Weak correlation was observed between the dependent variable (profit) and the independent variables (amount of produce purchased, taxes paid, transport and other costs, unit sales price) as

well as among the independent variables. The correlation coefficients range from 0.111 to 0.570. The correlation coefficients are not significant. It is worthy to note the weak correlation between the amount purchased (which reflects the quantity of produce) and the taxes ($r = 0.348$). The amount purchased and transport also have a weak positive correlation ($r = 0.479$) though stronger than the former. Details of the analyses are shown in Table 3.

Table 3: Summary of regression variables

Model	Dependent Variable	Const	VAR1	VAR2	VAR3	VAR4	SE	R ² (%)	F (a)	Sign
1	Y	A -88379	X ¹ 0.852	X ²	X ³	X ⁴	60973.	48.7	5.22	*
				4.987	0.965	327.74				
2	INY	(A)	(X1)	(X2)	(X3)	(X4)	1.72	55.9	6.9	*
		4.122	2.8E-05	-1.9E-04	1.1E-0	1.6E-02				
3	INY	(A)	(INX1)	(INX2)	(INX3)	(INX4)	1.57	63.0	9.37	*
		38.272	2.846	-0.301	-0.473	4.192				
4	Y	(A)	(INX1)	(INX2)	(INX3)	(INX4)	63069.2	45.1	4.5	*
		-1E+6	73153.5	1644.8	23072.7	63646.5				

Based on R^2 - value, significance of regression model and the standard error of estimate, the double-logarithm model was selected for predicting profit from the following variables, amount of produce purchased, value of taxes paid, transport and miscellaneous costs as well as unit sales price.

The model is stated as follows:

$$INY = -38.272 + 2.846 INX1 - 0.301 INX2$$

$$- 0.473 INX3 + 4.192 INX4$$

$$R^2 = 0.63$$

X1 = Amount purchased

X2 = Taxes

X3 = Transport and other costs

X4 = Unit/Sales Price

Y = Profit

SE = 1.570

The negative contribution of taxes and transport cost to the profit was observed.

Constraints

The following constraints were observed to affect the trade in Eru:

- Scarcity of eru
- High cost of transport
- Irregularity in the sale price
- Harassment by law enforcement agents
- Lack of credit facilities
- Difficulty of storing the produce

Table 4 shows the ranking of the associated trade problems while Table 5 shows the three most prevalent problems as difficulty of storing produce, scarcity of eru and high transport cost.

Table 4: Problem analysis

Problem	Rank 1 st	Rank 2 nd	Rank 3 rd	Total
Scarcity of eru	11	6	3	20*
High transport cost	2	4	10	16*
Irregularity in buying price	-	-	3	3
Harassment by law enforcement agents	4	4	4	12
Lack of credit facilities	1	1	3	5
Difficulty of storing the produce	9	12	4	25*

Source: Field survey, 2002.

* Most prevalent

Table 5: Ranking of the three most prevalent problems

Problem	Respondents' Ranking and Percentages		
	1 st	2 nd	3 rd
Scarcity of eru	40.7	22.2	11.1
Difficulty of storing produce	33.3	44.4	14.8
High transport cost	7.4	14.8	37.0

Source: Field survey, 2002.

Discussion

The market for Non-Timber Forest Products (NTFPs) is an open market because the products are generally gathered from the wild. According to Popoola and Oluwalana (1998), this open market creates weak barriers to exit and entry in the trade of NTFPs. However, trade in specific NTFPs have their own peculiarities. The trade in eru is dominated by women who participate from the harvesting to the sales of the produce to the wholesaler and indeed the consumer. The number of people involved in harvesting in most cases outnumbered those in the purchase. The overall effect is that in most cases, the demand is more than the supply from the wild. This has led to the constant upward price review and /or reduction of the size of a bundle. The bulk of eru purchased in Manyu Division ends up in markets in Nigerian towns. The most common towns are Ikom, Aba, Onitsha, and Abuja.

One of the methods of raising revenue for forestry service is through taxes/tariffs. From the study, it was realized that the fixing of taxes for eru (forestry taxes, phytosanitary taxes and council taxes) was done arbitrarily as could be confirmed by the low correlation between the amount of produce purchased (which reflects the quantity) and the taxes ($r = 0.348$). This arbitrariness has the tendency to breed corruption between the tax agents and the traders.

The low starting capital for the eru business of between 45,000 FCFA (₦ 7,830) and 80,000 FCFA (₦ 1,393) could be an 'incentive' for more people to enter into the trade. The effect of increasing number of traders on the sustainability of the resource base can only be negative in view of the present unsustainable harvesting method occasioned by cutting of vines and supports. The eru trade can be adjudged lucrative, with a profit range between of 82,685 FCFA (₦ 14,387) and 143,537 FCFA (₦ 24,975) and a Rate of Return on Investment (RORI) of between 44.4% to 70.8%.

In an attempt to predict the profit from variables like amount of produce purchased, taxes

paid, transport and miscellaneous costs, and unit sales price per bundle, the logarithms model proved most adequate ($R^2 = 0.63$, $SE = 15.57$). This model can be used with caution because of the unstandardized nature of the variables. It is however, important as a guide to expected profit. The trade in eru just like any other product has its attendant problems. Popoola and Oluwalana (1998) mentioned the problems militating against the smooth conduct of the NTFPs market. From the study, the three most prevalent problems in the eru trade in order of their importance are scarcity of eru; difficulty of storing the produce; and high transport cost. Scarcity of a natural resource is a indication that the resource base is depleting. Lack of marketing control measures, poor harvesting methods and the neglect of the development of the NTFP sub-sector of forestry could have been responsible for the unsustainable use of the resource, leading to scarcity. Two approaches can be adopted to redress this situation. First, domestication of this product should be encouraged through nationwide campaigns and technical assistance as well as the provision of propagules to the farmers. Secondly, to reduce pressure on the resource base and ensure natural regeneration, increase in forestry and associated taxes should be encouraged. The present forestry tax of 10 FCFA (₦1.74) per bundle is too low and can be considered instead as an 'incentive' for more people to engage in the trade.

Storage after harvest is very important. Eru is a perishable produce, which presently cannot be preserved beyond three weeks when fresh except sliced and dried. Also, because of the bulky nature of the quantities usually purchased for sale, it becomes difficult to apply the local method of preservation which involves wrapping the produce inside plantain leaves. Perishability has a direct effect on the resource base and market in general. As more of the produce is lost due to lack of storage facilities, the pressure on the resource base increases just as the loss may trigger increase in the price of available produce in the market. The need on how to store/preserve eru cannot therefore be

increases just as the loss may trigger increase in the price of available produce in the market. The need on how to store/preserve eru cannot therefore be overstressed. Poor road network can enhance perishability. This is especially the case during the rainy season for the Mamfe-Ekok road through which most of the produce pass to Nigeria.

Conclusion

An evaluation of Eru trade was carried out to appraise the profitability, problems and constraints as well as the relationships between independent variables like transport cost, forestry taxes, sale price per bundle, etc. and the dependent variable, gross profit enabled an inference on the contributive effects of the independent variables on net revenue. The number of people involved in harvesting in most cases outnumbered those in the purchase. The overall effect is that in most cases,

References

- Ailoundama, F. 1985. Nutritional and socio-economic value of gnetum leaves in central African forest. Technical Report. Pp.1-4.
- FWTA (1974): Flora of West Tropical Africa Textbook. Pp.1-7
- MINEF 1994. Divisional delegation of environment and forestry, FAKO Division, Limbe. Annual Report. 1-10pp.
- Momoh, S., Oluwalana, S.A., Dipeolu, A.O. 1999. Economic analysis of Trade in Rattan (*Eremospha Mancronpa*) and Rattan products in Lagos State, Nigeria. *Journal of Tropical Forest Resources* Vol.15.(1).Pp. 40-51.
- Nkefor, J. Ndam., Blackmore, P., Engaunge, F. Monono, C. 2002. Transfer of Eru (*Gnetum africanum* Welw. and *G. bucholzianum* Engl.): Domestication Model to Village based

the demand is more than the supply from the wild. This has led to the constant upward price review and /or reduction of the size of a bundle of Eru.

Recommendations

To improve on this trade and ensure availability of the resource in perpetuity, there is need for:

- (i) Nationwide domestication programme for the plant (*Gnetum sp*) to be complemented by increase in taxes and trade barriers.
- (ii) Studies should be encouraged to identify the best conditions for transporting the produce between markets
- (ii) An improvement in the road network in Manyu Division should be considered a priority.

Farmers on and around Mount Cameroon; Report to CARPE.

Nkefor, J. 2000. How to Grow Eru: A technical guide on how to construct a propagator and grow eru on a farm, Report to LBG. Pp.1-6.

Popoola, L. and Oluwalana, S.A. 1998. Marketing of non-timber forest products in Nigeria: Paper presented at colloquium on biodiversity (rainforest ecosystem of Nigeria), Nigeria. .

Shiembo, N.P. 1995. Assessment of the economic importance of non-timber forest products in Eastern Region of Korup Project Area, particularly villages of Nta-Ali Forest Reserve. Korup Project, Mundemba, Cameroon.

Sunderland, T. and Besong, S. 2002. A review of the non-timber forest products of the Takamanda Forest Reserve, Cameroon. A report of PROFA Mamfe. pp.1- 15.