COMPARATIVE ANALYSIS OF INCOME AND POVERTY STATUS OF WOMEN IN *KOKORO* (CORN SNACK) PRODUCTION AND ARABLE CROPS PRODUCTION IN OGUN STATE, NIGERIA

* KOLADE, V.O[1]; SOAGA, J.A[2]; MOMOH,S [1]; ADEGBITE, D.A.[1]
AND K.A. ELEMO [3]

[1]Department of Agricultural Economics
[2]Department of Forestry and Wildlife Management.
[3]Department of Crop production and Protection.
Federal University of Agriculture, Abeokuta, Ogun State

*Corresponding author: koladevictoria45@yahoo.com

ABSTRACT

The study analyzed the poverty status of women producing *Kokoro* (Corn snack) and women producing arable crops in Ogun State, Nigeria. A total of 208 respondents made up of 106 women producing *Kokoro* (Corn snack) and 102 women producing arable crops to serve as control group were selected. The respondents were selected based on non- probability method. Purposive sampling technique with Snowball method was used. Data were obtained by structured interview schedule. Data collected were analysed using FGT poverty index, costs and return and t-test statistics. The results indicated that 34.9kg of maize were processed into 128 dozens of *Kokoro* (Corn snack) per production run over an average of five (5) days, with six (6) production runs per month for nine months for the period of the research. The mean *Kokoro* (Corn snack) production cost was N42, 769.41/ respondent/ month with average revenue of N92, 253.60/ respondent/ month and net income of N49, 484.19/ respondent/ month. Income from *Kokoro* (Corn snack) production accounted for 53.4% of the total household income of N721,323.67 of an average woman engaged in *Kokoro* (Corn snack) production while farm income accounted for 67.9% of the total household income of N418, 935.10 of an average woman producing arable crops. The study also revealed that households of *Kokoro* (Corn snack) producers had mean per capita household income of N282.32 per person per day which was significantly higher (p<0.01) than those of women producing arable crops, N191.29 per person per day. Thus *Kokoro* (Corn snack) production has the potentials to enhance income and reduce poverty among households of rural women. The study thus recommends promotion of value- adding activities, such as maize processing into *Kokoro* as a means of enhancing income and reduces poverty among the rural folks.

Keywords*: Kokoro,* maize, poverty status, poverty index, production

INTRODUCTION

Poverty is multidimensional in nature hence cannot be easily defined. It is a relative concept involving individual's perception of his/her social standing in relation to others in a given society (Okoh, 1998). According to Bradshaw (2006), poverty is the lack of basic necessities of life such as food, shelter,

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medical care and security, which are thought necessary based on shared values of human dignity.

In Nigeria, like any other developing country, poverty has a predominantly female face, for instance, the fact that, of the more than 1 billion adults who have no access to basic education, more than 60 percent are women and that of the 1.3 billion absolute poor today, over 900 million are women (Quisumbing *et al.,* 2001).Women and households headed by women are frequently the most chronically poor within rural communities. They suffer the harshest deprivation and are extremely vulnerable to poverty (Dauda, 2002). They have lower social status than men and consequently less access to schooling and training, particularly in childcare and health practices. Yet women play significant roles in rural economic activities such as, production, processing and marketing of food crops to enhance family income (FAO, 2007).

 Income level and poverty status are related, income is expressed as the output of activities and it measures both cash and in kind contributions (Schwarze, 2004). According to De Janvry *et al.* (2005), income is referred to as household income from various sources including monetary income or income in kind. In this study, income from both farm and non- farm activities were identified and used for analysis. One of the non- farm activities practised by most women in the study area which earn them income is *kokoro* production.

Importance of *Kokoro* (Corn snack)

According to Food and Fertilizer Technology Centre, FFTC (2002), maize is one of the popularly consumed food crops in Nigeria. It is a popular food crop of high nutritional value, with crude protein and energy content of 10-12 percent and 3432kCal/kg respectively. It is used both as human food and for compounding livestock feeds. It is the third most important cereal crop after sorghum and millet in Nigeria (Ojo, 2000). The crop is widely consumed as a staple food by several households in various forms. It can be eaten as fresh boiled maize or roasted. The dried grains could be used in commercial quantities for flour, animal feeds, biscuits, beverages, beer, and as raw materials for making snacks (FFTC, 2002).

In Ogun State, *Kokoro* (a snack made from soaked and grinded maize grain, molded into ring shapes and fried) is a widely consumed maize product. It is of high nutritive value and easily digestible. *Kokoro* is produced by women, through value-addition to maize in rural communities of Yewa North Local Government Area of Ogun State.

Local production is encouraged because, it is the most stable way to improve livelihoods, enhance food processing and contributes to long term and broad based economic growth. By taking this approach, issues related to food productions which are directly related to poverty could be addressed.

1. The study specifically looks into:costs and return structure of *Kokoro* (Corn snack),
2. profitability of women producing *Kokoro* (Corn snack) and women producing arable crops,
3. comparison of income level and poverty status of households of women producing *Kokoro* (Corn snack) and women pro-

ducing arable crops.

METHODOLOGY

The research was carried out in Yewa North Local Government Area (LGA) of Ogun State, Nigeria. The Local Government consists of major towns and villages such as: Ayetoro (the administrative headquarter), Igbogila, Eggua, Owode- Ketu, Sawonjo, Ijoun, Oja – Odan, Imasayi, Ibooro, Joga – Orile, Isaga – Orile etc.

The area is endowed with derived savanna vegetation, which encourages the rearing of cattle with an average rainfall of 194mm and average maximum and minimum temperature of 30.17°C and 27.80°C respectively. It lies between Latitude 2° 45′ and 3° 15′North of the equator and Longitude 6° 45′ and 7° 30′ East of Greenwich Meridian (NBS, 2009).

In terms of land area, the LGA is the largest in Ogun State with a landmass of 375,503.26 ha and an estimated population of 181,826 people (NPC, 2006). The inhabitants of this Local Government Area are the Yewas, Eguns, Aworis and the Ketus who are predominantly farmers. Crops planted include, Maize, Cassava, Rice, Melon, Cocoa, Citrus, Cashew, Oil palm, tomato and vegetables.
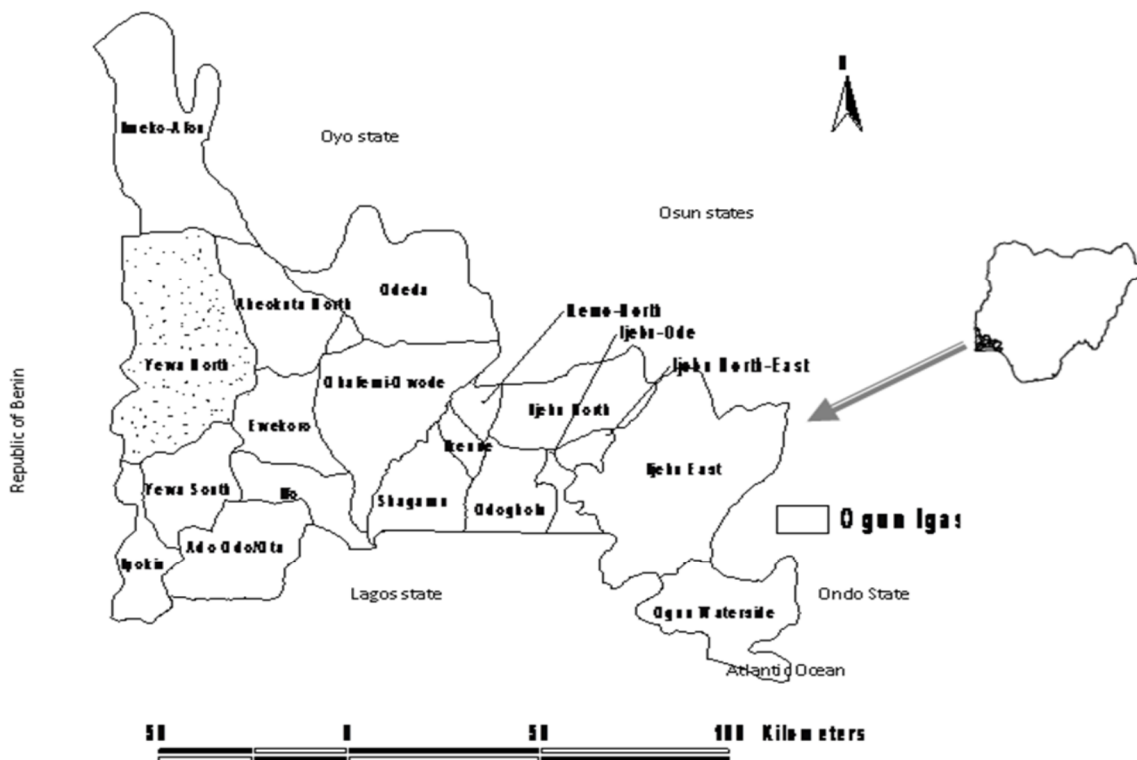

Figure 1: Map of Ogun State showing the Study area

The dotted portion represents Yewa North Local Government Area

This LGA was chosen because of the booming business of *Kokoro* production which the major raw material is maize. Maize is one of the major food crops planted by majority of the dwellers of this LGA.

Method of Data Collection
Sources of Data
This study was based on primary data obtained in a cross-section survey of women producing *Kokoro* (Corn snack) and women producing arable crops in Yewa North LGA of Ogun State, Nigeria. Data collected include the socio-economic characteristics of the women and their households; resource use, production costs, outputs and prices in *Kokoro* (Corn snack) production as well as other economic activities (farming and non-farming activities) of the women producing *kokoro* and women producing arable crops.

Sampling Technique and Sample size
Data were collected by administration of structured questionnaire. Purposive sampling technique with Snowball method was used to select a total of two hundred and twenty (220) respondents, comprises 110 women producing *kokoro* and 110 women producing arable crops.

Snowball sampling technique is a non-probability sampling method used when the desired sample characteristic is rare. It may be extremely difficult or cost prohibitive to locate respondents in these situations. Snowball relied on referrals from initial subjects to generate additional subjects, i.e. the interviewer identified one respondent among the members of the association who referred the interviewer to another respondent and the chain continued like that until the sample size is obtained (Salganik and Heckathorn, 2004).

Method of data analysis
Data collected were subjected to descriptive statistics (frequency, means, standard deviation and percentage), Foster, Greer and Thorbeck (FGT) index, and Costs and Return analysis.

Foster, Greer and Thorbecke (FGT) Poverty Analysis
The incidence, depth and severity of poverty among households of the study respondents were determined by computing per capita income based on FGT indices of poverty levels among various categories of the study respondents – women *Kokoro* producers, women producing arable crops, and socio-economic groups based on scale of operation, age, level of education and year of experience.

The general form of the FGT index is given as

$$p_\alpha = \frac{1}{N} \sum_{i=1}^{q} \left(\frac{Z - Y_i}{Z} \right)^\alpha$$

Where

P =   FGT poverty index ($0 \le P \le 1$), including the poverty incidence (when $\alpha = 0$), poverty gap (when $\alpha = 1$) and severity of poverty (when $\alpha = 2$);

N =   Total number of respondents (including the *women producing kokoro* and the women farmers);

Q =   Number of respondents

below the poverty line;

Z = Poverty line. Two types of poverty lines were used in the study; (a) an **absolute poverty line** defined as the equivalent of US$1 (i.e. N150) income per head per day; and (b) a **relative poverty line** defined by two-third of the mean per capita household income among all the study respondents;

Y_i = Per capita income of the ith woman's household,

α = FGT parameter ($\alpha >= 0$). The 'α' takes a value of 0, 1, and 2 with different implications viz. When $\alpha = 0$, it measures poverty incidence (the proportion of the people that are impoverished). When $\alpha = 1$, it measures poverty depth or the proportion of the poverty line that the average poor will require to attain to the poverty line. When $\alpha = 2$, it measures the severity of poverty, i.e. giving more weight to the poorest. The higher the value of FGT index, the greater the weight given by the index to the severity of poverty.

Costs and Return Analysis

This was used to assess the costs and returns structure and profitability of *Kokoro* production in the study area. Generally, profit is determined as:

P= TR-TC

TC=TFC+TVC

Where

P = Profit from the enterprise (N)

TR=Total revenue from the enterprise (N)

TC= Total cost incurred by the enterprise (N)

TFC=Total Fixed Cost incurred by the enterprise (N)

TVC=Total Variable Cost incurred by the enterprise (N)

Fixed and Variable cost items

The fixed cost items include: big iron pot for soaking, big frying iron pot, mixing bowls, big perforated spoons, big aluminium sieve, storage baskets, and wooden working surface. While the variable cost items include: maize, onions, salt, grinding, transportation, vegetable oil, and wrapping nylon, fire wood and water.

Hypothesis Testing

Student's t-test was used for the hypothesis, H_o: "Poverty level among households of *women producing kokoro* is not significantly different from those of other women in Yewa North LGA".

Student's t is expressed as:

$$t_c = \frac{\overline{X}_1 - \overline{X}_2}{\sqrt{\dfrac{\hat{\sigma}_1^{\,2}}{n_1} + \dfrac{\hat{\sigma}_2^{\,2}}{n_2}}}$$

Where

$\overline{X}_i$ = mean incidence of poverty among households of the ith category of respondents (i = 1 for women *Kokoro*

processors, and 2 for other women farmers);

$$\hat{\sigma}_i^2$$ = sample estimate of the population variance of the poverty incidence among households of the ith category of respondents;

n_i = number of women in the ith category of respondents.

RESULTS AND DISCUSSION

Socio- economic characteristics of the respondents

The results of socio- economic characteristics of the respondents for both *Kokoro* producers and women producing arable crops in the study area as presented in Table1 showed that the average age of *Kokoro (Corn snack)* producers was 48years while her counterpart that engaged in farming was 38years, both of which are within the categories of women in the active age group. Although majority (74.5%) of the *Kokoro (Corn snack)* producers were married while 25.5% were widowed, 98% arable crop farmers were married while only 2% were widowed. The average size of the *Kokoro (Corn snack)* producers' households was seven people as against six people for the crop farmers. While all the sampled rural women had not more than primary school education, an average *Kokoro (Corn snack)* producer is more literate than her counterpart engaged in farming, with as much as 77.5% of the *Kokoro (Corn snack)* producers having complete/incomplete primary school education while the majority (51.7%) of their

counterpart engaged in farming had no formal education. In terms of experience, an average *Kokoro (Corn snack)* producer have been in the business for about 17years, while an average woman farmer had been farming for about 15years, the years of experience possessed by both respondents are expected to have significant effect on their managerial capability.

Costs and Returns to *Kokoro* Production and Arable crop farming

The economic potentials of *Kokoro (Corn snack)* production were assessed with budgetary tool *vis-a-vis* its profitability. The results of costs and returns to *Kokoro (Corn snack)* production by the sampled women as summarised in Table 2 indicated that an average woman engaged in *Kokoro (Corn snack)* production completes an average of six production runs per month. This is particularly so because the products are targeted for periodic markets, most of which are held at intervals of 5-days, while the production process itself takes an average of four days. A typical *Kokoro (Corn snack)* producer produces an average of 128 dozens of *Kokoro (Corn snack)* per production run (767 dozens per month). These are sold at an average of N120 per dozen, providing an average of N92, 253.60 per month as revenue (production cost has not been deducted).

The monthly *Kokoro (Corn snack)* output was produced at a cost of N42, 769.41, 80.4 percent of which was spent on basic raw materials, most especially maize, vegetable oil and firewood. Labour accounted for an average of 14.9 percent of the production cost while machinery service accounted for 4.5 percent of the production cost.

An average *Kokoro* producer generated a net profit of **N**49, 484.19 per month with the

benefit-cost ratio estimated at 2.16. This shows that return on investment in *Kokoro* production was 116 percent; thus indicating that *Kokoro* production was profitable.

Table 1: Distribution of respondents by socio-economic characteristics

Description	Women producing kokoro		Women producing arable crops	
	Freq	**%**	**Freq**	**%**
Age (yrs)				
20 – 29	-	-	23	21.7
30 – 39	40	39.2	27	25.5
40 – 49	13	12.7	46	43.4
50 – 59	21	20.6	10	9.4
60 & above	28	27.4	-	-
Total	102	100	106	100
Average Age	48		38	
Standard deviation	12.6		9.2	
Marital status				
Married	76	74.5	104	98.0
Widowed	26	25.5	2	1.89
Total	102	100.0	106	100.0
Household size				
2-4	-	-	21	19.8
5-7	83	81.4	65	61.3
8-10	19	18.6	20	18.9
Total	102	100.0	106	100.0
Average size	7		6	
Standard deviation	1.2		1.8	
Education level				
No formal education	21	20.6	55	51.9
Quranic education	2	2.0	4	3.8
Incomplete Primary	46	45.1	22	20.8
Complete Primary	33	32.4	25	23.6
Total	102	100.0	106	100.0
Experience (years)				
1 - 10	35	34.3	46	43.4
11 – 20	36	35.3	39	36.8
21 – 30	19	18.6	21	19.8
31 – 40	12	11.8	-	-
Total	102	100.0	106	100.0
Average	16.6		15.1	
Standard deviation	10.7		8.8	

Source: Field survey, 2010

Table 2: Costs and Returns Profile of Average *Kokoro* Enterprise

Description	Amount (N)		%
Production Characteristics			
Average Outputs (Dozen/production run)	128.13		
Average Number of Production per month	6.00		
Average Price (N/dozen)	120.00		
Revenue (N/month}		92,253.60	
Production Costs (N/month)			
(a) Raw Materials			
Maize	14,134.50		
Vegetable oil	11,286.50		
Salt	633.81		
Water	640.00		
Onion	1,098.24		
Fire wood	4,717.65		
Transport	887.01		
Nylon	986.76		
Sub-total: Raw Materials		34,384.47	80.4%
(b) Labour		6,361.95	14.9%
(c) Machinery Service (Grinding)		1,905.87	4.5%
Transport	887.01		
Total Variable Cost		42,652.29	99.7%
Gross Margin		49,601.31	
Less: Depreciation (N/month)		117.12	0.3%
Total Cost (N/month)		42,769.41	100.0%
Net profit (N/month)		49,484.19	115.7%
Benefit-Cost Ratio		2.16	

Source: Field survey, 2010

Differences in Household Income

Considering that income level is a key factor in the assessment of household poverty, t-test of differences between the mean household farm income, mean household total income and mean per capita household income of women producing *Kokoro* and women producing arable crops were conducted. The results are presented in Table 3.

It was observed that the mean farm income of the households of women producing arable crops was slightly higher than that of women involved in *Kokoro* production, the difference is not significant ($p > 0.05$). However, the mean household income from all sources, and the mean per capita household income of women producing *Kokoro* is significantly ($p < 0.01$) higher than those of women

producing arable crops. This shows that *Kokoro* production contributed significantly (p<0.01) to household income which thus contribute more to poverty reduction in the study area.

Table 3: t-test of differences in household income of women producing *Kokoro* and women producing arable crops

Description	N	Mean	Std. Error	Calculated t-value	Critical t-value (p<0.05)	Comment
Farm Income (N/ year)						
Households of Kokoro Producers	102			-1.35	1.96	NS
		257,558.90	14,862.36			
Households Women producing arable crops	106	284,665.76	13,560.60			
Total Income (N/ year)						
Households of Kokoro Producers	102	721,323.67	35,287.63	7.55	1.96	S
Households of Women producing arable crops	106	418,935.10	18,927.02			
Per Capita Income (N/head/day)						
Households of Kokoro Producers	102	282.32	13.81	5.59	1.96	S
Households of Women producing arable crops	106	191.29	8.64			

NS- Not significant
S-Significant
Source: Field survey, 2010

Differences in Poverty levels between the respondents

The results of differences in poverty levels between women producing *Kokoro* and women producing arable crops are summarised in Table 4. The results revealed that, women producing arable crops have higher incidence of poverty, (P_0 = 71) than women producing *Kokoro* with incidence of poverty, (P_0 = 59).That is 71% of women producing arable crops fell below the poverty line of N236.8 while only 29% were above the poverty line. On the other hand, 59% of women producing *Kokoro* fell below the same poverty line while 41% were above the poverty line. Also, with respect to depth of poverty, P_1, women producing arable crops require as much as 59.14% of N236.00 (i.e. N140.00) to get to the poverty line, while women producing *Kokoro* require only 12.20% of N236.00 (i.e N 29.00) to get to the same poverty line. More also, in relation to severi-

ty of poverty, P_2 = 13.67 (women producing arable crops) while P_2 = 2.82 (women producing *Kokoro*) indicated that poverty is more prevalent among women producing arable crops than women producing *Kokoro.* This may be because return to investment in *Kokoro* production is immediate unlike crop farming.

Table 4: Poverty levels between women producing *kokoro* and women producing arable crops

	Poverty incidence (P0)	Poverty depth (P1)	Poverty severity (P2)
Women producing kokoro	59	12.20	2.82
Women producing arable crops	71	59.14	13.67

Source: Field survey, 2010

CONCLUSION AND RECOMMENDATIONS

The focus of the study is on poverty status between women producing *Kokoro* and women producing arable crops. The study identified that both enterprises were profitable in the study area. However, *Kokoro* production was more profitable than arable crop farming because the net income derived per year from *Kokoro* production and arable crops was N721323.67and N418935.10 respectively. Poverty line was estimated to be N236.8 per day. An average *Kokoro* producer requires N29.00 to get to poverty line per day, while arable crop farmers require as much as N140.00 to get to the same poverty line per day. Poverty existed among both groups of respondents as indicated by the fact that, 71% and 59% of the two groups respectively were below the poverty line. Poverty is however, relatively higher among women producing arable crops (depth of poverty, P_1= 12.20 for *Kokoro* producers and P_1= 59.14 for arable crop producers, severity of poverty, P_2=2.82 for *Kokoro* producers and P_2= 13.67 for arable crops producers). This is in agreement with Nicholas and Francesco (2000).

Generally there is significant difference between average annual income and poverty levels of *Kokoro* producers and arable crop farmers ($p < 0.05$) because t- stat > t- critical, both null hypotheses were rejected while accepting the alternative hypotheses.

Based on the research findings, it is recommended that there should be diversification of farm business by farmers: the appreciation of the fact that poverty level is lower among *Kokoro* producers than arable crop producers necessitates that arable crop producers should engage more in other income generating activities (other than farming) especially during the off season in order to increase their income level.

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