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### COMPARATIVE PROFITABILITY ANALYSIS OF JAMILA AND CP RICE VARIETIES PRODUCTION IN KURA LOCAL GOVERNMENT, KANO STATE, NIGERIA

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#### ABSTRACT

This study was on comparative profitability analysis of Jamila and CP rice varieties production in Kura local government area, Kano State. Specifically, the study investigated the profitability and problems of two rice varieties production in the study area. Primary data were used for this study. A Multistage sampling was used for this study and data were obtained from 90 rice farmers randomly selected from five wards in the study area. Data were analysed using descriptive statistics and farm budgetary techniques. Empirical estimates indicated that both Jamila and CP rice varieties production were profitable in the study area. However, the production of Jamila rice variety was more profitable with gross margin of ₦188741.01 compared to ₦118673.79 per hectare for CP rice producers. Some of the problems encountered by both farmers in the study area includes; high cost of inputs, high cost of labour and herd trespassing, price fluctuation, poor transportation network, pests and diseases and rainfall shortage. It is recommended that policy should be designed to ensure adequate supply of inputs to farmers at subsidized rates and introduction of laws that will be binding between the herd's men and the rice producers.

#### INTRODUCTION

Rice has become one of the most important staple foods in many fast growing African economies. Rice is the second most important cereals in the world after wheat in terms of production (Olaf and Lancon, 2003). Nigeria was ranked the highest producer and consumer of rice in the West Africa Sub-region (Gani and Omonona, 2000). It

produces an average of 3.2 million metric tons of paddy rice (2 million metric tons of milled rice) (Busari and Omonona, 2010) and consumed about 2.1 million metric tons of rice are consumed annually (Olaleye et al, 2004). Rice production potential in the country is about 4.6 to 4.9 million hectares of land but the actual area under cultivation is only 1 million hectares representing 22% of the total

potential available area (Olayele et al, 2004). In addition, the average annual rice production in Nigeria is dominated by small scale farmers using traditional methods of farming. As a result, there is wide gap between rice supplies to meet demand of the growing population in the country.

Since 1989, the federal government has designed policies and programmes aimed at boosting production to meet domestic demand which include amongst others, the Fadama rice Programmes, the Japanese Assisted National Rice Production Project as well as the River Basin Development Rice Programme. Despite these efforts by the government yields are still low leading to considerable rice importation in the country. The Food and Agricultural Organization (FAO) (2004) reported that about \$0.1million was spent on rice importation in Nigeria during 1970s. The value of rice importation annually increased to \$259 million in 1999 and reached about \$267 million in the year 2007 (Eke, 2008).

Various studies have shown that the productivity of rice production in Nigeria is constrained by several factors. For instance, Abdullahi (2012) found that the problems of pests and diseases, high cost of seed, fertilizer and labour encountered by rice farmers reduce productivity in Paikoro local government area of Niger state. Sani et al (2012) reported that lack of adequate fertilizer, capital and access to land were the major problems hindering rice production in Bunkure local government area, Jigawa state. Abdulrahman et al (2009) showed that lack of extension agent and lack of adequate inputs were the major problems that reduce rice output in small scale

production in Katcha local government area of Niger state.

The purpose of this study is to examine the profitability and problems of some selected rice varieties production in Kura Local Government area of Kano State. Kura is the largest rice producers in Kano state and one of the major rice producing areas in Nigeria. The cultivation of rice in the area can be dated back as far as 100 years ago. Different types of rice varieties are produced year in year out which includes Jamila, Yargas, CP, Weeter, Yargafan, and Seppi. They all undergo the same farming process but have different shapes, sizes and price but the farmers in the study area largely depend on the two varieties (CP and Jamila). The main objective of the study are to conduct a comparative profitability analysis between Jamila and CP rice and to describe the major problems encountered by the farmers of the two rice varieties in the study area.

## **2. Methodology**

### **2.1 Study Area**

Kura local government is one of the forty four local governments area in Kano state which is situated southwards of Kano city. Kura lies between latitude  $11^{\circ}46'17''N$  and  $11.77139^{\circ}N$  and longitude  $825^{\circ}49'E$  and  $8.4302^{\circ}E$  (NIPOST, 2009). It has an area of  $206km^2$  and a population of 144,601 (NPC, 2006). Over 70% of this population engaged directly or indirectly in agricultural activities. The major crop cultivated in the study area are lowland and upland rice; while maize, tomato, sorghum, millet, groundnut and pepper are produced as minor crops. Livestock farming is also practiced with sheep, goats, cattle, and poultry reared mostly on free range (Muhammad, 2011).

## 2.2. Sampling Technique and Sample Size

Kura local government area was selected for this study because rice is one of the major crops produced in the area. A multistage sampling was used for this study. There are ten (10) wards in the study area namely; Sarkin Kura, Tanawa, Kurinsumau, Dalili, Kosawa, Rugar Dukka, Karfi, Gun Dutse, Dan Hassan, and Dukawa; and five (5) wards were purposively selected from the ten (10) wards due to their intensive involvement in rice production in the study area. The wards selected are; Dalili, Karfi, Kurunsumau, Sarkin Kura and Dan Hassan for the data collection. Eighteen (18) producers were randomly selected per ward among which nine (9) were Jamila and nine (9) were CP making a total sample size of 90 respondents.

## 2.3 Method of data collection

Primary data and secondary data were both used for this study. Primary data collection was conducted by the means of structured questionnaire administered to randomly selected respondents. The secondary sources of information included textbooks, journals, articles, conference proceedings.

## 2.4. Method of Data Analysis

### 2.4.1 Descriptive Statistics

Descriptive statistics such as the frequency and percentages were used to

### 2.4.3 Paired Sample T-test

Paired sample T-test was used to compare and determine whether the differences in the gross margin (GM) between the two rice varieties were significant.

$$\text{Paired sample T-test} = \frac{X_a - X_b}{\sqrt{(SEX_a^2 - SEX_b^2)}}$$

Where;

analyse the data collected on the problems associated with Jamila and CP rice production.

### 2.4.2 Farm Budgeting

Gross Margin analysis was employed to estimate the profitability of the two rice varieties production to achieve objective one. It is a useful planning tool in a situation where fixed capital is negligible portion of farming enterprise as in the case of small scale subsistence agriculture (Olukosi and Erhabor, 1988).

#### Gross margin (GM)

$$GM = TR - TVC$$

Where:

GM = Gross margin (₦/ha)

TR = Total revenue in rice production (₦/ha)

TVC = Total variable cost in rice production (₦/ha)

**The profitability ratios of rice production were given below**

#### Operating ratio (OR)

This was calculated by dividing the total return by the total variable cost.

$$OR = \frac{TVC}{TR}$$

#### Return on Naira invested

This was calculated by dividing the total variable cost by total return

$$\text{Return on naira invested} = \frac{TR}{TVC}$$

$\chi_a$  = Mean gross margin of Jamila

$\chi_b$  = Mean gross margin of CP

$SEa^2$  = Standard error of Jamila

$SEb^2$  = Standard error of CP

### **3. Results and Discussion**

#### **Cost and returns associated with Jamila and CP Rice production**

Table 1 shows the estimates and findings of the costs and returns of Jamila rice production. The results indicated that costs of hired labour and fertilizer constituted for 35.65% and 29.73% of the total costs in Jamila production respectively. The result shows that costs of labour constitute the larger proportion of the total cost for Jamila production in the study area. The result contradicts findings of Hamidu (2001) who reported that labour constituted 65% of the total cost of production in Bauchi State. The result shows that land cost constituted 21.69% which is the one-fourth cost of production on land procurement. Seed cost constituted 4.74%, despite its importance in the production its cost is negligible compared to the other variables. . Chemical cost constituted 5.93% which was not that much costly. Other variable cost of production reported constituted 2.05% of the total cost of production in the study area. The gross margin, operation ratio and return per naira invested were ₦188, 741.01, ₦0.50 and ₦1.99, respectively for Jamila production in the study area. The result indicates that Jamila production is financially viable and profitable in the study area. This supports the findings of Sani et al (2012) who reported that the returns on every naira invested and operating ratio were 0.77 and 0.45 respectively.

#### **Paired Sample T-test for comparing the differences in profitability between Jamila and CP rice production**

The study further subjected the gross margin (GM) of the two rice

For CP rice variety, the results of the cost and returns analysis were reported in Table 2. The result shows that labour and fertilizer constitute 35.87% and 28.09%, the highest cost of production. This implies that labour input was the most costly item of the two rice production in the study area. The result contradicts findings of Hamidu (2001), who reported the cost of labour of 65% in rice production in Dass Local Government area of Bauchi state. Land cost constituted 23.18%, seed 4.23% and chemical was 6.30% in the study area. The results suggest that farmers were not spending much on fertilizer and chemicals because of the market price and less availability of the subsidized ones. Other variable cost of production reported constituted 2.32% of the total cost of production in the study area. The gross margin, operation ratio and return per naira invested were ₦118, 673.79, ₦0.57 and ₦1.73, respectively in CP production in the study area. The result also indicates that CP production was financially viable and profitable in the study area.

In summary, the results of the cost and return analysis indicate that Jamila rice variety is more capital intensive with variable cost of ₦191,415.66 than CP rice variety. Both the two rice productions were profitable in the study area even though Jamila rice producers had higher gross margin of ₦188741.01 than ₦118673.79 per hectare for CP rice producers.

varieties to statistical analysis using paired sample t-test to determine whether there is significant difference in their profitability.

Table 3 presents the paired sample t-test results for comparing the differences in profitability between Jamila and CP varieties. The result shows the significant (2-tailed) value of 0.005 for Jamila rice variety, implying that the gross margins of the two rice varieties were not the same and thus there is a significant differences in their profitability. The results confirmed that Jamila rice variety with an average gross margin of ₦165,140 was more profitable than the CP rice variety with an average gross margin of ₦104,330.

#### **Problems associated with Jamila and CP Rice Production**

Table 4 presents the distribution of respondents with regards to the problems militating against rice production in the study area. The results revealed that high cost of inputs which is 100% was the most serious problem encountered by both Jamila and CP rice producers. This reason may be as a result of financial incapacity of the farmers in the study area and lack of external support from other sources. The findings show that high cost of labor and herd trespassing accounted for 88.9% and 95.6% for Jamila and CP rice production respectively. The former could be as a result of higher competition because there were many farmers looking for labourers to employ. The issue of herd trespassing remains the problem for a quite long period, as the area comprises of farmers and herds men therefore this led to several clashes between the two parties. Price fluctuation constituted 77.8% and 88.9% of Jamila and CP respectively, which made it very difficult for the farmers to predict the price of their

output in the market even after production.

The result shows that lack of good roads to conveniently convey their outputs to the market after production was the major problem facing the two rice variety produces. This problem led to some loses in the production complained by 64.4% and 55.6% of Jamila and CP respectively. Furthermore, pests and diseases accounted for 33.3% and 26.7% of Jamila and CP respectively, this could be as a results of the farmer's inability to apply the chemicals used in control of the pest and disease. Lastly, rainfall shortage constitute 44.4% and 31.1% of Jamila and CP respectively, this could be associated to their inability to commence their farming operations at the onset of the raining season in the study area.

#### **4. Conclusion and Recommendation**

This study is a comparative profitability analysis between Jamila and CP rice varieties in Kura local government area of Kano State. The results show that the two rice productions were profitable in the study area. However, further statistical analysis indicated that Jamila rice variety production with a higher gross margin of ₦165,140 was more profitable compared to CP variety. The findings show that the producers of the two rice varieties production encountered the same problems during production, and the major constraints identified were: high cost of inputs, high cost of labour and herd trespassing, price fluctuation, poor transportation network, pests and diseases and rainfall shortage in the study area.

Based on the findings, the following recommendations were made:

1. Agricultural mechanization should be provided as alternative to human labour in order to do away with unnecessary cost of labour.
2. There is urgent need of government intervention through judicial sector to establish necessary laws or rules and regulation that would be binding between the herd's men and the rice producers to reduce conflict.

3. Government should endeavor to improved and construct rural roads to ease transportation, satisfy the increasing demand and facilitates produces distributions.

4. There is need for the government to provide the modern and latest chemicals capable of controlling pests and diseases affecting rice production in the study area.

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## Appendix

**Table 1: Estimated Costs and Returns per Hectare for Jamila Rice Production**

<b>Variables</b>	<b>Quantity (kg/ha)</b>	<b>Amount</b>	<b>Total cost %</b>
<b>Variable costs</b>			
Land (kg/ha)	0.83	41,333.3	21.69
Seed (kg/ha)	81.71	9,079.56	4.74
Fertilizer (kg/ha)	540	56,926.67	29.73
Chemicals (kg/ha)	11.40	11,358.89	5.93
Labor (man-day/ha)	58.84	68,819.19	35.95
Other cost	-	3,933.33	2.05
<b>Total variable cost</b>		191,451.66	100
<b>Revenue</b>			
Home consumption (kg/ha)	446.2	25,345.56	6.67
Gifts (kg/ha)	566	33,333.33	8.77
Sales (kg/ha)	2969	321,511.11	84.56
<b>Total revenue</b>		380,192.67	100
<b>Profitability indicators</b>			
Gross margin	188,741.01		
Operation ratio	0.50		
Return per naira invested	1.99		

Source: Field survey, 2013

**Table 2: Estimated Costs and Returns per Hectare for CP Rice Production**

<b>Variables</b>	<b>Quantity (kg/ha)</b>	<b>Amount</b>	<b>Total cost %</b>
<b>Variable costs</b>			
Land (kg/ha)	0.75	37,777.78	23.18
Seed (kg/ha)	56.93	6,898.22	4.23
Fertilizer (kg/ha)	431.11	10,274.44	28.09
Chemicals (kg/ha)	9.98	58,741.33	6.3
Labor (man-day/ha)	47.18	45521.12	35.87
Other cost	-	3777.78	2.32
<b>Total variable cost</b>	<b>162,990.67</b>		<b>100</b>
<b>Revenue</b>			
Home consumption (kg/ha)	385.67	19,566.67	6.95
Gifts (kg/ha)	498.44	30,197.78	10.72
Sales (kg/ha)	4,139.49	231,900	82.33
<b>Total revenue</b>		<b>281,664.45</b>	<b>100</b>
<b>Profitability indicators</b>			
Gross margin	118,673.79		
Operation ratio	0.57		
Return per naira invested	1.73		

Source: Field survey, 2013

**Table 3: Paired Sample T-test for comparing the profitability between Jamila and CP varieties**

<b>Variety</b>	<b>Mean</b>	<b>Std.Error</b>	<b>T-value</b>	<b>Sig (2-tailed)</b>
Jamila	165,140	1777.05	2.924	0.005
CP	104,330	12654.5	-	-

Source: Field survey, 2013

**Table 4: Distribution of respondents according to the constraints associated with Jamila and CP rice production**

<b>Marital status</b>	<b>Jamila Frequen cy</b>	<b>Percentag e</b>	<b>Ranking</b>	<b>CP Frequency</b>	<b>Percentag e</b>	<b>Ranking</b>
			1 <sup>st</sup>			
High costs of inputs	45	100		45	55.6	1 <sup>st</sup>
High costs of labor	40	88.9	2 <sup>nd</sup>	43	95.6	2 <sup>nd</sup>
Problem of herd trespassing	40	88.9	2 <sup>nd</sup>	43	95.6	2 <sup>nd</sup>
Price fluctuation	35	77.8	3 <sup>rd</sup>	40	88.9	3 <sup>rd</sup>
Poor transportation network	29	64.4	4 <sup>th</sup>	25	55.6	4 <sup>th</sup>
Problem of pests & diseases	20	44.4	5 <sup>th</sup>	14	31.1	5 <sup>th</sup>
Rainfall shortage	15	33.3	6 <sup>th</sup>	12	26.7	6 <sup>th</sup>