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Comparative Profit Analysis of Rice Production Enterprise among Farmers in Anambra and Ebonyi States, Nigeria

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Author's contribution

The sole author designed, analyzed and interpreted and prepared the manuscript.

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ABSTRACT

The study compared profitability of rice production enterprise among farmers in Anambra and Ebonyi States, Nigeria. The population of the study included all rice farmers in the two states. A multistage sampling technique in combination of purposive and simple random sampling techniques was used to select 160 rice farmers. Primary data through the use of validated interview schedule were used to collect data for the study. Data were analyzed using percentage, mean and gross margin (GM) analysis. Results of the finding showed that majority of rice farmers were within their middle, active and productive ages; and had very long years of rice farming experience. Farmers in Anambra State made gross margin (GM)/net profit of ₦ 59,105 and ₦ 55,355 from paddy sale using transplanting and broadcasting methods, respectively, while the benefit/cost ratio (BCR) per 0.5 ha of paddy production were 1.83 and 1.85 for transplanting and broadcasting methods, respectively. In Ebonyi State, farmers made net profit of ₦ 53,800 and ₦ 48,100 from transplanting and broadcasting methods in 0.5 ha, respectively, while the BCR per 0.5 ha of paddy production were 1.56 and 1.73 for transplanting and broadcasting methods, respectively. Therefore, overall rice production enterprises in the two states are profitable and lucrative ventures.

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Inadequate fund for start-off, difficulty in obtaining credit, inadequate improved processing and milling machinery, high cost of privately sold agro-input such as fertilizers, poor road network, difficulty in forming co-operative society, poor extension service visit to farmers, high cost of rice production among others were the serious constraints to rice production identified. The need to increase farmers' access to credit in order to boost rice production and increase income was recommended. Also, both indigenous and foreign investors were highly encouraged to invest into rice production.

Keywords: Profitability; rice production; Nigeria.

1. INTRODUCTION

Rice is both a food and a cash crop for farmers, contributing to smallholders revenues in the main producing areas of Nigeria. Rice is grown in approximately on 3.7 million hectares of land in Nigeria, covering 10.6 percent of the 35 million hectares of land under cultivation, out of a total arable land area of 70 million hectares; 77 percent of the farmed area of rice is rain-fed, of which 47 percent is lowland, while 30 percent upland [1]. The range of grown varieties is diverse and includes both local and enhanced varieties of traditional African rice (such as NERICA) [2]. Most rice farmers (90 percent of total) in Nigeria are smallholders, applying a low-input strategy to agriculture, with minimum input requirements and low output [3]. Nigeria rice productivity is among the lowest within neighbouring countries, with average yields of 1.51 tonne/ha [4]. Onimaes [5] noted that rice can be grown conveniently in Nigeria, the climate is good. It can be grown both in the forest and savannah areas of Nigeria. The project is, therefore, technically feasible. The project is highly profitable. Price of rice in the market is very good for the producers, hence the project's economic viability.

Profitability may be examined in at least three main ways: Profitability across rice-based production systems; profitability in relation to other crops; and profitability in terms of technology adoption by rice farmers. In all these, rice production has been found to be quite profitable in Nigeria. However, domestic rice is not as profitable as it would have been if there were no stiff competitions from imported rice [6]. According to Nwite, Igwe and Wakatsuki [7] the adoption of technologies and improved management practices should lead to substantial yield increase in rice production. Longtau [8] recalled that the establishment and growth of ADPs, RBDAs, and cheap fertilizers were responsible for increase in rice production through large-scale farming and mechanization. Emongór et al. [9] observed that rice production in all the different ecosystems was profitable even though irrigated rice production was more profitable than rain fed rice production. On the other hand, Erenstein et al. [10] noted that milling operations carried out for a fee by millers-only are financially viable under the current average level of milling fees (2 to 3 Naira per kg of rice) which represent a marginal amount (below 5%) of the rice market price at the retailing spot.

The United States Agency for International Development (USAID) Maximizing Agricultural Revenue and Key Enterprises in Targeted Sites (MARKETS) (USAID MARKETS) [11] noted that farmers can earn from 10-25% more per ton by adopting improved growing techniques. This is as a result of 'Building a Competitive Rice Industry' which can change yields to 4.5/5.0 tons per hectare. It further observed that average yield per hectare for transplant, broadcast and subsistence methods were 5.0 tons, 4.5 tons and 2.0 tons and production cost per ton of ₦30,602.00, ₦25,280.00, ₦45,231.00/ton, thus making a profit per hectare of ₦139,489.00, ₦149,489.00 and ₦29,539.00 respectively. Thus farmers made highest profit per hectare using broadcast method followed by transplant method. Therefore, for profitability realization in rice production, transplant and broadcast techniques are recommended; subsistence method serves as typical traditional way of rice production by local farmers thereby recorded very low in yield and revenue generation, but highest in cost of production.

Olatoye [12] noted that a farmer can harvest close to 3-5 tonnes of rice in one hectare depending on the variety which is about 100 bags (25 kg). A 25 kg of rice is about ₦3,500. So about ₦350, 000 can be realized from 1hectare of land. An investment on 100hectares will yield ₦35,000,000 per harvest and rice can be grown twice a year if it is mechanized. Uba [13] noted that rice milling could be done on cottage, small, medium and large scale bases depending on

availability of capital and the raw materials-paddy rice. Output could be from 2MT to 150MT per day. Generally one metric tonne of paddy rice yields about 60 kg- 70 kg of milled rice, depending on milling efficiency company management practice and the variety of rice purchased. From market analysis, the market for rice is national. With the estimated national population growth rate of 2.9% and population Figure estimated at over 130 million, Nigeria is a large market and demand is so high and local supply, so low that rice importation into the country is a very big business. Hoarding, rationing and smuggling and sharp black market practices were the profitability associated with the business [13].

The potential in investment in rice production in Nigeria cannot be overestimated. This is why both indigenous and foreign investors are seriously going into it. It has also been found out that our local rice (Ofada for example) is more nutritious than the imported ones. Estimated revenue realizable by the project is about ₦400 million annually. Annual production costs have been put at ₦270 million. Annual profit of ₦130 million is guaranteed [5]. Anambra and Ebonyi States are the major rice producers in the southeast Nigeria. The need to compare the profitability of rice production in the two states becomes necessary to serve as a feasibility study for new entrants into the enterprise in these two locations. The question now is how profitable is the rice production enterprise in the two states and what problems militate against its production?

The objectives of the study were designed to:

1. Examine socio-economic characteristics of the rice farmers in Anambra and Ebonyi States;
2. Compare profitability of rice production enterprise in two different planting methods (transplanting and broadcasting) in both states; and
3. Identify constraints to rice production in the study area.

2. METHODOLOGY

The study was carried out in Anambra and Ebonyi States in the south-east zone of Nigeria. Anambra State of Nigeria is made up of 21 Local Government Areas (LGAs) and four Agricultural Zones (AZs) - Aguata, Anambra, Awka and Onitsha. It is located in the South-East region of Nigeria between longitude 6° 36'E and 7° 21'E and latitude 5° 38'N and 6° 47'N. The State is bounded in the north by Kogi State, in the west by River Niger and Delta State, in the south by Imo State and on the east by Enugu State. Anambra State occupies an area of 4,416 sq. km and has a population of 4,177,828 out of which 2,117,984 are male and 2,059,844 female. The number of farm families is 338,721 with an average size of 6 persons per farm family or household [14]. The climate is typically equatorial with two main seasons, the dry and the rainy seasons. The state experiences dry season from late October to early May and has at least six dry months in the year. The vegetation consists of rainforest. Other parts consist of woody savannah and grasslands. Crops, livestock and fisheries are main stock in the farming system of the state. Major crops grown in the state among others include rice, cassava, yam, maize, okra, cocoyam, melon, cowpea and pigeon pea. The State has a population of about 25,000 rice farmers and 33 public extension agents [14].

Ebonyi State is made up of thirteen LGAs. It lies on latitudes 5° 40'N and 6° 45'N and longitudes 7° 30'E and 8° 46'E. It occupies an area of about 5,935 km^2, which is approximately 5.8 per cent of the total land area of Nigeria with a population of 2,173,501 people. The State is semi-savannah with seasonal variations of hot, mild cold weather and mixed grid vegetation with all eastern prototypes including agrarian, forestry and swamp which are ideal for rice production. The climate is a tropical hot humid type characterized by high rainfall, high temperature and sunshine with two marked seasons: the rainy and dry. The major occupation of the State is farming with a population of 145,109 rice farmers and 202 public extension agents [15].

The population of the study included all rice farmers in both Anambra and Ebonyi States of Nigeria. A multistage sampling technique was used to select 160 farmers. In the first stage, four LGAs were purposively selected from each state based on their high rice production activities. These included Abakiliki, Ezza North, Ikwo and Izzi LGAs in Ebonyi State; Anambra East & West, Awka North and Ayamelum LGAs in Anambra State. The second stage involved a random selection of 16 communities, 2 each from the 8 selected LGAs in the states. The third stage involved selection of a total of 160 farmers, 10 each from the 16 selected town communities using simple random sampling technique. This formed the sample size of the study. Primary

data were used to collect data for the study. The primary data for the study were collected through validated interview schedule for farmers.

The socio-economic characteristics of the respondents were measured as follows:

> Age (actual age in years), sex (male or female), marital status (married, widowed and separated), educational level (no formal education, primary school attempted, primary school completed, secondary school attempted, secondary school completed, tertiary education etc.), rice farming experience (number of years spent in rice farming), total rice farm size cultivated in hectare, rice planting method (transplanting, broadcasting and direct sowing (dibbling seeds)).

To compare the profitability of rice production of the project farmers, the cost and return of a half (0.5) hectare of rice production using two planting methods (transplanting and broadcasting) for the 2013 cropping season were, ascertained. The profitability was measured using gross margin (GM) analysis and compared in the two major planting methods adopted and in two different locations - Anambra and Ebonyi States. To achieve this, the average operating input and labour cost; and revenue per a half hectare of rice production of the project farmers in each planting method, were ascertained. The operating input and labour costs were measured as follows: Planting materials (rice seeds in kg); rent on land (hectare); land clearing/preparation (in hectare/chain/man-day); fertilizer (bag/kg); herbicide (in litre); insecticide (in litre); nursery preparation and management (bed); transplanting/seed broadcasting (in hectare/chain/man-day); manual weeding (in chain/man-day); labour on agro-chemical application (man-day/ hectare); feeding of labour (number); harvesting (rice cutting, gathering/packing, threshing) (man-day, heap); produce/paddy handling (winnowing and bagging) & transportation (number of 100kg bag). The gross margin (GM)/net profit (NP) was calculated as the total revenue (TR) less total variable cost (TVC). Also, Benefit/cost ratio (BCR) or Return on investment (RI) which is the return the rice farmers are getting from their investment in rice production enterprise was computed as the ratio of the total revenue (TR) or GM to the total variable cost (TVC). Benefit/cost ratio (BCR) was computed as: TR/TVC.

To identify the major constraints to rice production in the study area, the farmers were asked to indicate on a 3-point Likert-type scale, how serious each of the various shortlisted problems militates against rice productivity in the area. Their response categories were: Very serious (VS) = 3; serious (S) = 2; and not serious (NS) = 1. These values were added to obtain a value of 6 which was divided by 3 to get a mean score of 2.0. The respondents' mean were obtained on each of the items. Any mean score ≥ 2.0 was regarded as a serious/major constraint; while any mean score < 2.0 was regarded as not serious/minor constraint.

Data were analyzed using percentage, mean and gross margin (GM) analysis.

3. RESULTS AND DISCUSSION

3.1 Socio-Economic Characteristics of the Respondents

Data in Table 1 show that greater percentage (35%) of the rice farmers in Anambra State were between 40-49 years of age while their mean age was 49.18 years. It is also evident from the Table that greater proportion (33.7%) of the rice farmers in Ebonyi State were between 40-49 years of age and the mean age was 49.20 years. This implies that both farmers in the two states were at their middle and productive age. This finding is in line with that of Nwalieji and Uzuegbunam [16] which reported that majority of rice farmers are still within their middle, active and productive ages and hence can engage efficiently in rice production. Majority (72.5%) of the respondents in Anambra State were male. Also majority (63.8%) of the farmers in Ebonyi State were male. This implies that rice production enterprise in the area under study is dominated by male since they are said to have stronger aspiration to invest in rice production enterprise than females. The finding is in line with that of Oyeleke [17] which opined that rice production is clearly the work of men, whereas rice post harvest activities are clearly the domain of women.

Table 1 further shows that majority (76.2%) of the farmers in Anambra State were married, while in Ebonyi State, majority (78.8%) of the farmers were married. These findings imply that there are more married rice farmers in the study area. In Anambra State, greater proportion (37.5%) had no formal education, while in Ebonyi State half (50.0%) of the farmers had no formal education. The findings generally show that

about 63% and 50% of the farmers in Anambra and Ebonyi States, respectively were literate who could read and write by having attended formal education. The high literacy rate of the farmers would immensely aid in high adoption of rice technologies introduced in the area. Majority (61.3%) of the respondents in Anambra State had household sizes of 6-10 persons and the mean household size was 8 persons. In Ebonyi State, majority (60.0%) of the farmers had household sizes of 6-10 persons and the mean household size was 9 persons. These findings imply that both farmers had very large household sizes which could provide cheaper source of farm labour.

Table 1 shows that greater proportion (31.3%) of the farmers in Anambra State had 10-19 years of rice farming experience and the mean rice farming experience was 25.08. in Ebonyi State, greater proportion (35.0%) of the farmers had 30-49 years of experience, and the mean rice farming experience was 25.76 These findings imply that the farmers had very long years of rice farming experience which could serve as an advantage in participation and adoption of improved rice technologies introduced in the area. Table 1 also reveals that majority (62.5%) of farmers in Anambra State had less than 2 hectares and the mean total rice farm land owned was 1.75. Also in Ebonyi State, majority (88.8%) of the farmers had less than 2 hectares, while the mean total rice farm land owned was 1.17 hectares. These findings imply that rice farmers are generally relatively small holders. Greater proportion (51.2%) of the farmers in Anambra State engaged in seed rice broadcasting method, while in Ebonyi State, majority (71.3%) of the farmers engaged in rice transplanting method. This implies that broadcasting method is mainly used by farmers in Anambra State, while farmers in Ebonyi State mainly transplant their rice. The nature of rice planting method adopted affects the yield and the number of hectares a farmer may put under cultivation.

3.2 Profitability of Rice Production Enterprise in Anambra and Ebonyi States

3.2.1 Profitability of transplanting and broadcasting methods in Anambra State

Table 2 shows gross margin analysis of 0.5 hectare of rice production of the farmers in Anambra State for 2013 planting season, compared in two different planting methods (transplanting and broadcasting methods). Entries in the Table reveal that total rice production costs per 0.5 ha were ₦70,895 and ₦64,895 for transplanting and broadcasting methods, respectively. This implies that rice farmers incur lesser cost of production by using broadcasting method than transplanting. Data in Table 2 also reveal that the average total revenue from paddy sale per 0.5 ha for transplanting and broadcasting methods, were ₦130,000 and ₦120,250, respectively. The finding implies that rice farmers realized more/higher income using transplanting methods.

Table 2 further reveals that farmers made gross margin/net profit of ₦59,105 and ₦55,355 from paddy sale using transplanting and broadcasting methods, respectively. This implies that rice farmers made greater profit in selling their rice paddy using transplanting method. Also, further analysis in the same Table indicates that benefit/cost ratio (BCR) per 0.5 ha of paddy production were 1.83 and 1.85 for transplanting and broadcasting methods, respectively. This means that for every Naira invested in paddy rice production, the farmer realizes ₦1.83 using transplanting method, while farmer realizes ₦1.85 using broadcasting method. This implies that growing rice using broadcasting method is more cost effective than transplanting method. In conclusion, the two enterprises compared are lucrative and profitable, but broadcasting methods is somehow better since it has more return on investment. However, intensification of rice production using transplanting and broadcasting methods would increase productivity in the study area and generate more income to the rice farmers.

3.2.2 Profitability of transplanting and broadcasting methods in Ebonyi State

Data in Table 3 show gross margin analysis of 0.5 hectare of rice production of the farmers in Ebonyi State for 2013 planting season, compared in two different planting methods (transplanting and broadcasting methods). Entries in the Table reveal that total rice production costs per 0.5 ha were ₦96,200 and ₦65,900 for transplanting and broadcasting methods, respectively. This implies that rice farmers incur lesser cost of production by using broadcasting method than transplanting. Data in

Table 3 also reveal that the average total revenue from paddy sale per 0.5ha for transplanting and broadcasting methods, were ₦150,000 and ₦114,000 respectively. The findings imply that rice farmers realize more income using transplanting method.

Table 1. Percentage distribution of respondents according to their socio-economic characteristics

Variable	Anambra (n=80)		Ebonyi (n=80)	
	%	M	%	M
Age (years)				
20-29	02.5		00.0	
30-39	15.0		18.8	
40-49	35.0	49.18	33.7	49.20
50-59	28.7		30.0	
60-69	18.8		17.5	
Sex				
Male	72.5		63.8	
Female	27.5		36.2	
Marital status				
Single	05.0		03.8	
Married	76.2		78.8	
Widowed	17.5		17.5	
Separated	01.2		00.0	
Educational level				
No formal education	37.5		50.0	
Primary school attempted	07.5		07.5	
Primary school completed	27.5		26.2	
Secondary school attempted	01.2		00.0	
Secondary school completed	15.0		10.0	
Tertiary education (OND/NCE)	03.8		03.8	
HND/First Degree holder	07.5		02.5	
Household size (number)				
1-5	16.2		15.0	
6-10	61.3	8.00	60.0	9.00
11-15	20.0		25.0	
16-20	02.5		00.0	
Rice farming/work experience (years)				
0-9	02.5		00.0	
10-19	27.7		31.2	
20-29	31.3	25.08	23.8	25.76
30-39	28.5		35.0	
40-49	10.0		10.0	
Total rice farm size (hectare)				
0-1.9	62.5		88.8	
2.0-3.9	30.0		11.2	
4.0-5.9	05.0	1.75	00.0	1.17
6.0-7.9	02.5		00.0	
Rice planting method				
Transplanting	47.5		71.2	
Broadcasting	51.2		26.3	
Direct sowing (dibbling seeds)	01.2		02.5	

Source: Field survey, 2014

Table 2. Gross margin analysis of transplanting and broadcasting on 0.5 hectare of rice farmers in Anambra State for 2013 planting season (n=80)

Operation/Item	Unit	Transplanting method			Broadcasting method		
		Qty	Unit price ₦	Total value ₦	Qty	Unit price ₦	Total value ₦
Paddy production cost:							
Planting materials (seed rice)	Kg/basin	45	80	3600	90	80	7200
Rent on land	hectare	0.5	20000	10000	0.5	20000	10000
Purchase of Glyphosate	Litre	2	775	1550	2	775	1550
Purchase of propanil	litre	2	1450	2900	2	1450	2900
Purchase of 2,4-D	litre	0.4	987.5	395	0.4	987.5	395
Purchase of NPK	Bag/kg	2	5500	11000	2	5500	11000
Purchase of Urea	Bag/kg	1	5300	5300	1	5300	5300
Purchase of foliar fertilizer	litre	1	1200	1200	-	-	-
Purchase of Insecticides	litre	1	1100	550	1	1100	550
Rice nursery establishment	Bed	2	300	600	-	-	-
Land preparation- Mechanical or manual clearing, ploughing and harrowing	hectare/ man-day	2	3500	7000	2	3500	7000
Application of systemic herbicide like Glyphosate before ploughing or for zero tillage	Man-day/ litre	1	500	500	1	500	500
Seed rice broadcasting	Man-day	-	-	-	1	500	500
Transplanting/supplying	Man-day	8	1000	8000	1	700	700
Manual weeding/ picking	Man-day	8	300	2400	8	300	2400
Herbicide application (Propanil & 2,4-D)	MD/litre	2	500	1000	2	500	1000
Insecticide application	MD/Litre	2	500	1000	2	500	1000
Fertilizer application	MD/bag	2	500	1000	2	500	1000
Bird scaring	Man-day	-	-	-	-	-	-
Harvesting (cutting & gathering)/ panicle harvesting	Man-day	8	800	6400	8	800	6400
Harvesting (mechanical or manual threshing)	Heap/bushel	1	6500	6500	1	5500	5500
Total production cost per 0.5ha				70895			64895
Revenue from 0.5 hectare of rice:							
Total revenue from paddy rice	Bag (100kg)	20	6500	130000	18.5	6500	120250
Gross margin/Net profit for paddy rice				59105			55355
Benefit/Cost ratio for paddy production				1.83			1.85

Source: Field survey, 2014

Table 3 also shows that farmers made gross margin/net profit of ₦53,800 and ₦48,100 from paddy sale using transplanting and broadcasting methods, respectively. This implies that rice farmers made greater profit using transplanting method. Also, further analysis in the same Table indicates that benefit/cost ratio (BCR) per 0.5ha of paddy production were 1.56 and 1.73 for transplanting and broadcasting methods, respectively. This means that for every Naira

invested in paddy rice production, the farmer realizes ₦1.56 using transplanting method, while farmer realizes ₦1.73 in paddy rice production, using broadcasting method. This implies that the two enterprises compared are lucrative and profitable. However, growing rice using broadcasting method is more cost effective than transplanting method in the study area as indicated by the benefit/cost ratio in Table 3. This finding is in line with USAID MARKETS [18] which noted that broadcast rice is more cost effective than transplanted rice.

Table 3. Gross margin analysis of transplanting and broadcasting on 0.5 hectare of rice farmers in Ebonyi State for 2013 planting season

Operation/Item	Unit	Transplanting method			Broad casting method		
		Qty	Unit price ₦	Total value ₦	Qty	Unit price ₦	Total value ₦
Paddy production cost:							
Planting materials (seed rice)	Kg/basin	30	150	4500	60	150	9000
Rent on land	hectare	0.5	10000	5000	0.5	10000	5000
Purchase of Glyphosate	Litre	2	950	1900	3	950	2850
Purchase of propanil	litre	2	1150	2300	2	1150	2300
Purchase of 2,4-D	litre	0.5	1100	550	0.5	1100	550
Purchase of NPK	Bag/kg	2	5500	11000	2	5500	11000
Purchase of Urea	Bag/kg	1	4600	4600	1	4600	4600
Purchase of foliar fertilizer	litre	-	-	-	-	-	-
Purchase of Insecticides	litre	0.5	1200	600	1	1200	1200
Rice nursery establishment	Bed	1	750	750	-	-	-
Land preparation- Mechanical or manual clearing, ploughing and harrowing	hectare/ man-day	20	700	1400	-	-	-
Application of systemic herbicide like Glyphosate before ploughing or for zero tillage	Man-day/litre	2	500	1000	3	500	1500
Seed rice broadcasting	Man-day	-	-	-	1	1000	1000
Transplanting	Man-day	25	800	20000	-	-	-
Manual weeding/ picking	Man-day	10	400	4000	10	400	4000
Herbicide application (Propanil & 2,4-D)	MD/litre	2	500	1000	2	500	1000
Insecticide application	MD/Litre	1	500	500	2	500	1000
Fertilizer application	MD/bag	2	500	1000	1	500	1000
Bird scaring	Man-day	30	250	7500	30	250	7500
Harvesting (cutting & gathering)/ panicle harvesting	Man-day	20	300	6000	16	300	4800
Harvesting (mechanical or manual threshing)	Heap/bushel	50	200	10000	38	200	8000
Total production cost per 0.5ha				96200			65900
Revenue from 0.5 hectare of rice:							
Total revenue from paddy rice	Bag (100kg)	25	6000	150000	19	6000	114000
Gross margin/Net profit for paddy rice				53800			48100
Benefit/Cost ratio for paddy production				1.56			1.73

Source: Field survey, 2014

4. CONSTRAINTS TO RICE PRODUCTION

Table 4 shows the mean distribution of identified constraints to rice production in Anambra and Ebonyi states. The data reveal that inadequate fund for start-off (M= 2.88); difficulty in obtaining credit (M=2.81); inadequate improved processing and milling machinery (M= 2.69); high cost of privately sold agro-input such as fertilizers (M= 2.88), poor road network (M= 2.74), difficulty in marketing products (M= 2.22), difficulty in forming co-operative society (M= 2.09), poor extension service visit to farmers (M= 2.44), high cost of rice production (M= 2.52), unfavourable weather condition/climate change (M=2.59), price fluctuation of produce (M=2.53), ineffective government policies on rice importation (M= 2.30) and high rodent, pest and disease infestation (M= 2.04) were the serious constraints to rice production in Anambra State. In Ebonyi State, inadequate fund for start-off (M= 2.66); difficulty in obtaining credit (M=2.78); inadequate improved processing and milling machinery (M= 2.12); high cost of privately sold agro-input such as fertilizers (M= 2.82), poor road network (M= 2.76), difficulty in forming co-operative society (M= 2.24), poor extension service visit to farmers (M= 2.38), high cost of rice production (M= 2.68), unfavourable weather condition/climate change (M=2.06), price fluctuation of produce (M=2.35), ineffective government policies on rice importation (M= 2.38) and high rodent, pest and disease infestation (M= 2.16) were the serious constraints identified. These findings imply that there are numerous constraints to rice production and the serious ones identified are almost the same in the two states compared. Table 4 also reveals that the standard deviation values were less than one in all cases, showing that the responses of the farmers on these problems did not vary much from the mean, signifying convergence of views with regards to these constraints.

The findings are in line with USAID [19] which reported that Nigerian rice farmers were not able to produce enough rice to feed the country because they lack limited access to fertilizers and credit which lead to an inability to meet quality standards and a lower rate of production. Also Nigeria MARKETS [20] reaffirm that farmers need loans to invest in quality inputs; they need access to inputs, and often require training to increase production and meet quality standards. Daramola [21] recalled that the annual domestic output of rice still hovers around 3.0 million metric tons, leaving the huge gap of about 2 million metric tons annually, a situation, which has continued to encourage dependence on

Table 4. Mean distribution of respondents according to major constraints to rice production

Constraint	Anambra State n= 80		Ebonyi State n = 80	
	Mean (M)	SD	Mean (M)	SD
Inadequate fund for start-off	2.88*	0.333	2.66*	0.633
Difficulty in obtaining credit	2.81*	0.480		0.732
Inadequate improved processing and milling machinery	2.69*	0.466	2.12*	0.481
High cost of privately sold agro-input such as fertilizers	2.88*	0.746	2.82*	0.634
Poor road network	2.74*	0.830	2.76*	0.823
Difficulty in marketing products	2.22*	0.693	1.80	0.624
Difficulty in forming co-operative society	2.09*	0.679	2.24*	0.647
Poor extension service visit to farmer	2.44*	0.737	2.38*	0.613
High cost of rice production	2.52*	0.644	2.68*	0.588
Poor access to fertilizer	1.80	0.624	1.46	0.623
Poor access to herbicide and insecticide	1.69	0.628	1.35	0.702
Unfavourable weather condition/climate change	2.59*	0.630	2.06*	0.680
Inadequate land for massive rice production	1.55	0.745	1.28	0.432
Price fluctuation of produce	2.53*	0.503	2.35*	0.591
Poor access to improved seeds	1.34	0.594	1.43	0.700
Ineffective government policies on rice importation	2.30*	0.537	2.38*	0.533
High rodent, pest and disease infestation	2.04*	0.674	2.16*	0.706
Poor yield/low productivity	1.54	0.762	1.73	0.477

**= M ≥ 2.00 = Serious problem SD= Standard deviation*

importation. Some of the reasons for the gap according to him are connected with the improper production methods, scarcity and high cost of inputs, rudimentary post - harvest and processing methods, inefficient milling techniques and poor marketing standards.

5. CONCLUSION

Overall rice production in the study area is profitable. Although farmers made greater gross margin (GM)/net profit in 0.5 hectare of rice production from paddy sale using transplanting method than broadcasting method in Anambra and Ebonyi States, the broadcasting method was more cost effective; however, the two planting methods compared are lucrative and profitable enterprises in both states. Therefore, both indigenous and foreign investors are highly encouraged to invest in rice production enterprise since it pays. However, the serious constraints to rice production identified in both states were inadequate fund for start-off, difficulty in obtaining credit, inadequate improved processing and milling machinery, high cost of privately sold agro-input such as fertilizers, poor road network, difficulty in forming co-operative society, poor extension service visit to farmers, high cost of rice production, unfavourable weather condition/climate change, price fluctuation of produce, ineffective government policies on rice importation and high rodent, pest and disease infestation.

The following recommendations are made:

1. Since poor access to credit was one of the prominent constraints to rice production, bearing in mind that rice production is capital and labour intensive enterprise and requires cash to undertake most of the farming operations, there should be increase in access to credit by these farmers. To achieve this, governments should come up with policy that would provide farmer friendly credit to rice producers in order to reduce or minimize the difficulties encountered in accessing the credit by farmers. Also, public/private institutions such as banks that provide credit to farmers, should formulate education programmes to build capacity and sensitize farmers on how to acquire and use credit efficiently.
2. To minimize cost in rice production, farmers should be encouraged to adopt zero tillage system in both broadcasting and transplanting methods of planting, for more profit.
3. Good marketing situation should be created such as strengthening the sale of paddy to credible processors/buyers. Here, farmers should be well-trained and made to be aware of this arrangement.

COMPETING INTERESTS

Author has declared that no competing interests exist.

REFERENCES

1. Ojehomon VET, Adebayo SB, Ogundele OO, Okoruwa, et al. Rice data systems in Nigeria: National rice survey 2009. Building a rice data system for sub-saharan Africa; 2009.
2. Bayou Farms and Industries Limited. Rice value chain development plan, Kaduna Rice Industry Supply Chain Development Programme. Submitted to MSME Nigeria; 2009.
3. International Fund for Agricultural Development (IFAD). Enabling poor rural people to overcome poverty in Nigeria; 2009. Available:http://www.ifad.org/operatons/projects/regions (Retrieved on 9th June, 2012)
4. Cadoni P, Angelucci F. Analysis of incentives and disincentives for rice in Nigeria. Technical Notes Series, MAFAP, FAO, Rome; 2013. Available:http://www.fao.org/mafap
5. Onimaes O. How to go into integrated rice processing. Businessday, Monday 30 January; 2012. Available:http://www.businessdayonline.com/NG/index.php (Retrived on March 4, 2013)
6. Akande T. An overview of the Nigerian rice economy; 2001. Available:http://www.unep.ch/etu/etp/events/Agriculture/nigeria.pdf (Retrieved on 16th September, 2011)
7. Nwite JC, Igwe CA, Wakatsuki T. Evaluation of Sawah rice management system in inland valley in south – eastern Nigeria. Soil Chemical Properties and Yield. Paddy Water Environment. 2008; 6(3):299–307.
8. Longtau SR. Multi-agency partnerships in West African agriculture: A review and

description of rice production systems in Nigeria; 2003.
Available:http://www.odi.org.uk/resources/download/3045.pdf (Retrieved on 16th September, 2011)

9. Emongór RA, Mureithi FM, Ndirangu SN, Kitaka DM, Walela BM. The rice value chain in kenya with reference to rice producers; 2009.
Available:http://www.joe.org/joe/1992spring/a4.html (Retrieved on 12th January 2013)
10. Erenstein O, Lançon F, Akande SO, Titilola SO, Akpokodje G, Ogundele OO. The Nigerian rice economy in a competitive world: Constraints, opportunities and strategic choices rice production systems in Nigeria: A survey. Abidjan: WARDA; 2003.
11. USAID MARKETS. Opportunities for investment in cassava, rice & sorghum. Nigerian Agricultural Sector Workshop Lagos; 2009a.
Available:http://nigeria.usembassy.gov/uploads/
12. Olatoye O. About rice production and processing. Nigerian Tribune, Tuesday, 16 August, 2011.
Available:http://www.tribune.ng.org
(Retrieved on Monday, March 04, 2013)
13. Uba G. Nigeria: Investing in rice production and rice processing project. Tuesday, 15 January, 2013.
Available:www.thiday.ng (Retrieved on 4th March, 2013)
14. Anambra State ADP (ASADEP). End of year 2011 report.
15. Ebonyi State ADP. Farmers inventory file; 2009.
16. Nwalieji HU, Uzuegbunam CO. Effect of climate change on rice production in Anambra State, Nigeria. Journal of Agricultural Extension. 2012;16(2):81-91.
17. Oyeleke BO. Management of major pest of rice in Tanzania. Department of Crop Science and Production, Sokoine University of Agriculture, Morogoro, Tanzania; 2009.
18. USAID MARKETS. Package of practices for rice production. Nigeria, Abuja; 2009b:1-23. Retrieved on 10th November, 2012 from Rice-POP-English-June-2009 [1].pdf
19. USAID. Telling our story; 2000.
Available:http://www.usaid.gov/ (Retrieved on 8th September 2012)
20. Nigeria MARKET. Rice; 2012.
Available:http://www.nigeriamarkets.org/Rice.mht (Retrieved on 10th September, 2013)
21. Daramola B. Government policies and competitiveness of nigerian rice economy. Paper presented at the `Workshop on Rice Policy & Food Security in Sub-Saharan Africa' organized by WARDA, Cotonou, Republic of Benin; 2005.

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