Comparative Profitability Analysis of Small Holder Upland And Irrigated Rice Productions In Anyamelum, Anambra State, Nigeria

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ABSTRACT

The study compared the profitability of small holder upland and traditionally irrigated (not mechanized) Rice productions in Anyamelum LGA of Anambra State. Umumbo community was purposively chosen for the study as the area is known for rice production. Data was generated from 120 respondents (rice farmers) randomly selected from 5 villages in Umumbo. Economic indices used were gross margin, Net return and Benefit-cost ratio. From the empirical analysis, irrigated rice production gave a net return of N76.110 and BCR of 1.82:1 against net return of N30,438 and BCR of 1.36:1 realized from upland production. Result shows that irrigated production is more profitable than upland system. Rice farmers are advised to adopt irrigation system of production to reap more profit and improve their standard of living.

KEYWORDS: Food crises, Productivity, Rice, Upland, Irrigation.

INTRODUCTION

The world is currently played with food crises, due partly to the unexpected rise in human population and the alarming drop in the per capita food production, particularly since the last decade (NRCRI, 2009). The global food crises and its resultant higher food prices have serious effect on household across the country.

Given that Nigeria is a net importer of cereals, the country has been hard hit by rising import prices. Poor rural households spend substantial earnings on food.

Nigeria is by far the largest rice importer in West Africa with an average yearly import of 1.6million metric tons since the year 2000 (USAID, 2008). Nigeria's current rice production stands at 2.8 million tons while total consumption stands at 4.4 million tons. Thus, creating a deficit of 1.6 million tons (Nwachukwu et al 2009).

There are various methods of production of rice such as swamp, upland and irrigated. Farmers in Umumbo adopt upland rice production and practice traditional shifting cultivation to produce subsistence crops. Upland rice production depends on the rain cycle.

Rice farmers in Umumbo are skeptical of adopting irrigation system of production. They are afraid of risking their hard earned money and time. A well planned and executed irrigation is one of the promising ways of reaping the benefits of modern agricultural technology. FAO (1977) maintained that irrigation development is often a precondition for maximizing production where lack of water is a limiting factor. The most obvious advantage of irrigated production is the opportunity of securing higher prices of out-of-season production drought induced shortages (Omara, 1992; Laverton 1984).

The objective of this study is to compare the profitability of upland and traditionally irrigated {not mechanized}rice productions in Anyamelum area of Anambra Stste to encourage participation in Rice production and boast production.

METHODOLOGY

The study was carried out in Anyamelum LGA of Anambra State. Umumbo Community was purposively chosen for the study. The community is known for rice production. Data was generated from 120 respondents (rice farmers) randomly selected from 5 villages (Isamoyi, Ifite-Ora, Uga, Ikenga and Iboji) in Umumbo using a well-structured questionnaire.

The economic indices used were Gross margin, Net return and Benefit-cost-ratio. Net return was computed from the Gross margin of the enterprise following (Mbanasor and Obiora, 2003; Onuoha et al, 2009).

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They are expressed as follows:

$$GM = \frac{\Sigma = P_iQ_i}{n} - \frac{\Sigma = P_jX_j}{n}$$

Gm = Gross Margin
 Pi = Unit price of output
 Qi = Quantity of each output
 Pj = Unit price of each input
 Xj = Quantity of each input

Net Returns = Gm – TfC

The implicit cost of fixed assets used in production was estimated. The straight line method was adopted.

$$D = \frac{C - S}{n}$$

Where D = Depreciation on the assets
        S = Salvage value
        n = Expected useful life

RESULTS AND DISCUSSION

Table 1: Socio-Economic Characteristics of the Respondents

Variable	Frequency	Percentage
Age of Respondents (Yrs)		
20 – 30	5	4.1
31 – 40	11	9.1
41 – 50	38	31.7
51 – 60	47	39.2
61 and above	19	15.8

Level of Education

Illiterates	12	10
Primary Sch. Incomplete	34	28.3
Primary Sch. Completed	47	39.2
Sec. School incomplete	18	15
Sec. School completed	9	7.5

Level of Involvement

Part time	**31**	**25.8**
Full time	**89**	**74.2**

Production Experience (Yrs)

1 – 5	32	26.7
6 – 10	47	39.2
11 – 15	35	29.2
16 and Above	6	5

Source: Field Data, 2010.

Socio –economic characteristics of respondents is presented in table I. The table shows the age, level of education, level of involvement and farming experience of the respondents. Data shows that 4% of respondents were between 20 to 30 years of age, whereas 9% were between 31 to 40 years. Farmers who were between 41 to 50 years constitute 32% of the respondents. Data also revealed that 39% of the farmers fall between 51 to 60 years of age, while 16% were 61 years and above. Majority of the respondents were within the ages defined by FAO (2000) as economically productive in a population (15 – 64).

On educational background, none of the respondents had post-secondary education. Only 8% of the respondents completed secondary education. Thirty nine percent completed primary education, while 28% did not. Ten percent of the farmers did not attend any form of formal education. Thus, 62% of the respondents had at least primary education and could read and understand publications in developments in agriculture.

Data on level of involvement shows that 26% of the farmers engaged in part-time rice farming while 74% engaged in full time. Hence majority (74%) of the respondents are highly committed in the business as it is their only source of income.

The investigation equally revealed that 27% had 1 – 5 years production experience, 39% had 6 – 10 years experience, while 29% had 11 – 15 years experience. The data also shows that 6% had 21 years and above production experience. Thus, respondents have acquired sufficient knowledge to understand their needs and problems.

Table 2: Net farm Returns Analysis Of a Hectre of Upland Rice Production

	Quantity/Mandays	Unit Price	Total
A. Total Revenue			
Output	**28.8 Bags** **50kg = 1 bag**	**400**	**115,200**
B. Variable cost items			
Land preparation	27	700	17,500
Cost of Seed			2,200
Plant/Transplanting	9	600	5,400
Cost of Herbicide	5	1,200	6,000
Herbicide Application	2	500	1,000
Fertilizer Application	6	600	3,600
Cost of Fertilizer	4	2,000	8,000
Bird Scaring	6	400	2,400
Harvesting	7	500	3,500
Parboiling & Drying	3	500	1,500
Cost of Bags	29	100	2,900
Bagging	2	500	1,000
Transportation	-	-	2,900
Milling	29	200	5,800
Opportunity cost of capital at 20%			11,176
Total Variable Cost (TVC)			74,876

C.   Fixed Cost

Rent	5,200
Depreciation Cost on Tools (wheel barrows, hoes, machetes, etc)	3,216
Opportunity cost of fixed capital of 20%	1,476
Total Fixed Cost (TFC)	9,886

D. Total Cost (TC) = TFC + TVC = 84,762

Net Return (TR – TC)	30,438
Benefit Cost Ratio (BCR) =	1.36:1

Source: Field Data, 2010.

Net return analysis of upland rice production is shown in table 2. Average output of rice produced per hectare was 1440kg with total value of ₦115,200, Total variable cost were made up of cost of seed, herbicide, fertilizer, bags, milling, transportation and labour. Procurement of planting seeds, herbicide and fertilizer constitute 2.9%, 8.01% and 10.68% of variable cost respectively. Cost of bags, milling and transportation totaled ₦11,600 representing 15.5% of total variable cost. Labour cost, that is expenses for land preparation, planting, transplanting, herbicide application, bird scaring, harvesting parboiling and drying were ₦48,700 representing 51.10% of variable cost and 57.5% of total cost. The result shows that upland rice farming in the study area is labour intensive. Labour intensive production cannot generate surplus to feed the population, create the domestic basis for industry and modern services (Nwosu, 2002). Interest which the capital tied up in the farm operations could have earned in alternative investment was ₦11,176, while depreciation of tools used in production was ₦3,216.

The analysis shows total cost of production as N84,762 while total revenue realized from sale of milled rice was ₦115,200. Net return was ₦30,438 with benefit cost-ratio (BCR) of 1.36:1. Hence, small holder upland rice production in the study area is profitable.

Table 3: Net Farm Returns Analysis of a Hectare of Rice Production with traditional Irrigation {not mechanized}

A. Total Revenue	Quantity/Mandays	Unit Price	Total
Output	38.5 Bags 50kg = 1 bag	4400	169,400
B. Variable cost items			
Land preparation	19	600	11,400
Cost of Seed	110kg		2,200
Plant/Transplanting	11	700	7,700
Water Chance			5,300
Cost of Herbicide	5	1,200	6,000
Herbicide Application	3	500	1,500
Fertilizer Application	7	600	4,200
Cost of Fertilizer	4 bags	2,000	8,000
Bird Scaring	3	500	1,500
Harvesting	5	500	2,500
Parboiling & Drying	5	400	2,000
Cost of Bags	38.5	110	3,960
Bagging	2	500	1,000
Transportation	-	-	3,800
Milling	38.5	200	7,700
Opportunity cost of capital at 20%			13,952
Total Variable Cost (TVC)			82,712

C.   Fixed Cost

Rent	5,200
Depreciation Cost on Tools (wheel barrows, hoes, machetes, etc)	3615
Opportunity cost of fixed capital of 20%	1,763
Total Fixed Cost (TFC)	10,578

D.   Total Cost (TC) = TFC + TVC = 93,290

Net Return (TR – TC)   76,110

Benefit Cost Ratio (BCR) TR/TC = 1.82:1

Source: Field Data 2010.

In the irrigation method of rice production (Table 3), 1925kg of milled rice was realized giving total sales of ₦169,400. Variable and total cost of production were ₦82,712 and ₦93,290 respectively. Cost of provision of water was ₦5,300 representing only 5.7% of total cost of production. This method of production gave Net returns of ₦76,110 and Benefit-cost-ratio (BCR) of 1.82:1 indicating profitability. The result implies that every ₦1 invested in irrigation rice production returns ₦1.82k while upland system returns ₦1.36k.

Conclusion

The study showed that small holder traditional{Not mechanized}irrigation rice production is more profitable than the upland system. Irrigation method gave a net return of N76,110 and BCR of 1.88:1 while upland system gave a net return of N30,438 and BCR of 1.36:1. Farmers are advised to adopt irrigation system of production to boost rice production required for attaining food security and industrial growth of Nigeria.

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