

COST AND RETURNS ANALYSIS OF SMALL-HOLDER PIG PRODUCTION IN NIGER DELTA REGION, NIGERIA: IMPLICATION FOR PROTEIN INTAKE SUSTAINABILITY

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ABSTRACT— The main objective was to analyse the mean profitability of small-holder pig production. A multi-stage sampling method was used in the purposive selection of 72 pig farmers. Structured questionnaires were implemented for data collection and data was analysed using cost and returns analysis model and descriptive statistics. Farmers' mean were 38 years 7 months with moderate mean family size of 9 persons. The male married farmers were more with low educational level. The mean 10 pigs flock size was recorded with a production experience of 28 years engaging in pig rearing on part-time basis. The study recorded mean annual revenue of ₦445,275 (\$1,083.80) and production expenses of ₦337,000 (\$820.26). The study recorded 1.32 benefit-cost ratio indicating 32% profit. Most constraints experienced were insufficient funds and low flock size. The study recommends that respondents should be motivated to increase their flock size and farmers' accessibility to credit facilities should be a priority.

KEYWORDS: Cost and returns, pig production, protein, sustainability, smallholder

1. INTRODUCTION

In Nigeria, the pig is inadequate and in short supply, hence serious measures must be adopted for sustainability and economic improvement [10]. Pig accounted for approximately 4% of total livestock domesticated in Nigeria with great survival and adaptation ability [1]. Pig raising is low despite the shortage in protein consumption in Nigeria [12]. Nigeria's provision of protein consumption is inadequately providing approximately 35g out of 65-75g daily needed protein intake by a person in Nigeria [11]. Despite the fact that poultry alongside pigs business is the fastest growing flock sector globally [4]. Special attention must be focused on its rearing to increase its protein production level. A research survey has shown that pigs were in short supply in Nigeria which accounted for about 1% of slaughtered animals and consumed daily in Nigeria [5]. The net income was affected by charges of labour, feed, fund and diseases as reported by [10]. Also, another scholar [9] stated that expenses on feeds, labour, education and age were factors influencing the net revenue of farmers. This study focused on the profitability evaluation of small-holders pig rearing and its implication for protein intake sustainability. The study is to block the shortage gap of protein consumption and the viability of pig rearing in the Niger Delta region, Nigeria. Also, pieces of literature available have shown that limited studies have been undertaken on pig cost and returns alongside its constraints in the Niger Delta region, Nigeria. Thus this study tends to cover the literature gap that existed.

This gives room to the following salient objective

1.1 Objectives of the survey

The survey was planned to:

- i examine the socio-economic characteristics of smallholder pig farmers
- ii analyse the small-holder pig farmers mean annual revenue
- iii analyse the small-holder pig farmers mean annual cost of farming
- iv evaluates the mean cost and returns of smallholder pig farmers;
- v examine the small-holder pig farmers' constraints.

2 Methodology

2.1 Study area

The study area is made up of nine states namely, Akwa-Ibom, Abia, Bayelsa, Cross-River, Ondo, Delta, Imo, Edo, and Rivers States with diverse ethnic nationalities with a total population of 30,554,689 persons.

Table 1: Population density of Niger Delta Region, Nigeria

States	Population
Abia	2,845,380
Akwa-Ibom	3,178,950
Bayelsa	1,704,515
Cross River	2,892,988
Delta	4,112,445
Edo	3,233,366
Imo	3,927,563
Ondo	3,460,877
Rivers	5,198,605
Total	30,554,689

Source: [8]

The region is the economic hub of Nigeria as it is blessed with natural mineral resources (crude oil) and mostly practices agriculture for its livelihood.

2.2 Sampling

A multi-stage sampling process was used in the purposive selection of 72 pig farmers utilized for the research study. Firstly, four states were selected randomly from the total nine states of the Niger Delta region. Secondly, two local government areas (LGAs) each were selected randomly to give a sum of eight LGAs. Thirdly, three communities each were selected randomly from the eight LGAs giving a sum of 24 communities. Lastly, three pig farmers each were selected purposively from the 24 communities giving a sum of 72 pig farmers.

2.3 Data collection and analysis

Questionnaires that were structured were implemented in the collection of data and evaluated applying descriptive statistics such as mode, mean, percentages and frequencies.

2.4 Model specifications

$$\text{Mean} = \frac{\sum fX}{\sum f} \dots\dots\dots i$$

$$\text{TCp} = \text{TVCp} + \text{TFCp} \dots\dots\dots ii$$

$$\text{GMp} = \text{TRp} - \text{TVCp} \dots\dots\dots iii$$

$$\text{NRp} = \text{GMp} - \text{TFCp} \dots\dots\dots iv$$

$$\text{BCRp} = \text{TRp}/\text{TCp} \dots\dots\dots v$$

Where:

Σ = Summation sign F = Frequency

X = Class mark

TRp = Total Revenue of Smallholder pig production

TCp = Total cost of pig production

TVCp = Total variable cost of small-holder pig production

TFCp = Total fixed cost of small-holder pig production

NRp – Net Returns of small-holder pig production

BCRp = Benefit-Cost Ratio of small-holder pig production

3 Result and Discussion

3.1 Socio-economic characteristics of Pig farmers

Table 2 specified that the average farmers' age was 38 years 7months revealing productive age with a moderate mean size of a family of 9 persons. Pig farmers (87.5%) who were mostly married (88.9%) with secondary school level (37.5%) dominated. The mean flock size of 10 pigs was dominant with a mean farming experience of 28 years that was usually on a part-time basis (81.9%). These discoveries collaborated with the research finding [3] that married male households and mean family size of 9 persons with low education level actively engaged in flock production in Delta State, Nigeria.

Table 2: The socio-economic characteristics of smallholder pig farmers

	Frequency	Percentage (%)	Mode/Mean
Age (years)			
22 – 31	15	20.8	38years 7months
32 – 41	30	41.7	
42 – 51	23	31.9	
52 – 61	04	5.6	
> 61	00	00.0	
Family Size (persons)			
1 – 4	08	11.1	9 persons
5 – 8	21	29.2	
9 – 12	29	40.3	
13 -16	14	19.4	
Gender			
Male	63	87.5	Male
Female	9	12.5	
Marital Level			
Single	05	6.9	Married
Married	64	88.9	
Widow	2	2.8	
Divorced	1	1.4	
Educational level			
No formal education	16	22.2	Secondary
Primary school	19	26.4	
Secondary school	27	37.5	
Tertiary school	10	13.9	
Farming Experience (years)			
1 – 9	7	9.7	22 years
10 – 18	14	19.4	
19 – 27	29	40.3	
28 – 36	22	30.6	

Farming business status			
Full-time	13	18.1	
Part-time	59	81.9	Part-time

Source: Field data

3.2 Pig farmers mean annual Revenue (Naira)

The parameters in Table 3 show that a matured pig's mean weight was 56kg and the mean selling price was ₦795 per kg. The computation used involved ten pigs with a mean annual revenue of ₦445,275 (\$1,083.80) was obtained. This is similar to the reports of [3] who stated that pig income contributed substantially to farmers' annual income in Delta South Agricultural Zone, Nigeria.

Table 3: Small-holders pig farmers mean annual Revenue (Naira)

10 pigs	Abia (₦)	Delta (₦)	Ondo (₦)	River (₦)	Entire Area (₦)	Mean (₦)
Quantity sold (kg)	510	600	570	560	2,240	560
Selling Price (₦)	790	800	780	810	3,180	795
Total Revenue (₦)					1,781,100	
Mean Revenue (₦)						445,275

Source: Field data

3.3 Small-holder pig farmers mean annual production cost (Naira)

Table 4 showed the cost association in pig rearing were piglet purchase, labour, feed, medication, transport, security and miscellaneous (cost of water, oil, fuel etc) giving a total variable cost of ₦328,000. The fixed cost of land rent, interest on loan and depreciation on tools giving a total fixed cost of ₦8,500. The total production cost was ₦337,000 (\$820.26). These findings collaborated [7] that the total variable cost ₦142,518.59 is higher as equated to the fixed cost ₦9,995.47 in pig rearing in Nigeria. Also [7] agreed with the discoveries that total variable cost represented 93.5% and the total fixed cost was 6.5% in Oyo State.

Table 4: Small-holders pig farmers mean annual production cost (Naira)

Cost for 10 pigs	Entire Area (₦)
Variable Cost	
Piglet purchasing cost	100,000
Labour cost	80,000
Feed cost	110,000
Medication cost	6,000
Transport cost	5,000
Security cost	24,000
Miscellaneous cost	3,500
Total Variable Cost (TVC)	328,500
Fixed Cost (FC)	
Rentage cost	4,500
Interest on loan	2,500
Depreciation on tools	1,500
Total Fixed Cost (TFC)	8,500
Total Cost = TVC + TFC = 328,500 + 8,500	337,000

Source: Field data

3.4 Mean cost and returns analysis of smallholder pig production

Variables in Table 5 stated that the total revenue was ₦445,275 (\$1,083.80) and the total cost of production

was ₦337,000 (\$820.26). Gross margin and net returns were ₦116,775 and ₦108,275 respectively indicating profit. The benefit cost ratio was 1.32 indicating that for each ₦1 invested, 32kobo (32%) profit was realized. Profit recorded was 32% which was quite encouraging considering the rural setting of the Niger Delta region, Nigeria. These assertions were similar to the assertions of [2] that affirmed that pig rearing in Ekiti State has 1.34 benefit-cost ratio. Also, [7] stated that pig business was profitable in Oyo State.

Table 5: Small-holders pig farmers mean cost and return analysis

Variables	Entire Area (₦)
Total Revenue (Naira) TRp	445,275
Total Variable Cost (Naira) TVCp	328,500
Total Fixed Cost (Naira) TFCp	8,500
Total Cost (Naira) TCp	337,000
Gross Margin (GMp) = Rp – TVCp	445,275 – 328,500
Gross Margin (GMp)	116,775
Net Returns (NRp) = GMp – TFCp	116,775 – 8,500
Net Returns =	108,275
Benefit Cost Ratio (BCRp) = TRp/TCp	$\frac{445,275}{337,000}$
Benefit Cost Ratio =	1.32

Source: Computed from field data

3.5 Constraints in small-holders pig production

Table 6 revealed the constraints experienced by pig rearers were insufficient to fund, mortality, malnutrition, disease incidence, climatic condition, waste disposal, feed, land acquisition, high-security cost, high labour cost, marketing and housing. The most constraint was insufficient funds to carry our management operations. This is similar to the finding of [6] that identified difficulties in loan securing (fund), labour cost and sizes of flocks as major constraints.

Table 6: Small-holders pig farmers constraints

Constraints	Frequency	Percentage (%)
Insufficient fund	70	12.0
Mortality	42	7.2
Malnutrition	31	5.3
Diseases incidence	48	8.2
Climatic condition	39	6.7
Waste disposal	69	11.8
The exorbitant cost of feed	68	11.6
Land acquisition	47	8.1
High security	38	6.5
High labour cost	53	9.1
Marketing	28	4.8
Housing problems	51	8.7

Source: Field data

4. CONCLUSION

Farmers' mean age was 38 years 7 months and dominated by married male households with secondary school educational level. The mean flock size of 10 pigs was recorded with farming experience of 28 years which engaged in pig rearing on a part-time basis. The study recorded mean annual revenue of ₦445,275 (\$1,083.80)

and a production total cost of ₦337,000 (\$820.26). It also recorded 1.32 benefit-cost ratios indicating 32% profit. Most constraints experienced were insufficient funds and low flock size.

5 RECOMMENDATION

The study recommends that pig farmers should be motivated to increase their flock size and credit facilities should be made available by the government and NGOs.

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