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Determinants of Profitability of Grasscutter Farming in South East Nigeria

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Uka, U.U.
Department of Agribusiness &Management, Michael Okpara University of Agriculture

Mbanasor, J. A.
Department of Agribusiness &Management, Michael Okpara University of Agriculture

Nto, P. O.
Department of Agribusiness &Management, Michael Okpara University of Agriculture

Aigbokie, S.O.
Department of Agricultural Economics, Gregory University, Uturu Abia State

Corresponding Author's E-mail: aigbokiesunday@gmail.com

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ABSTRACT
This study, Determinants of profitability of grasscutter farming business was carried out in South East Nigeria. Data were analyzed using descriptive and multiple regression model. Data were collected using structured questionnaire. The results showed that the average return per enterprises was N325,200.00, with net return per Naira investment of 1.07 with gross ratio (57.55%) and operating ratio (38.18%) with the solvency ratio (0.19). Multiple regression showed the coefficients of age of business (290719.30), amount of credit used (294991.00), value of asset (-6181.583), price of mature grasscutter (152750.90), number of competitors (-31148.8) and other cost (-83775.27) influenced profit of grasscutter enterprise in south east Nigeria. The study therefore recommended that government should ensure that farm inputs such as feeds/salt, drugs/vaccines, forage and credit are made available to the enterprises at a subsidized rate, to increase profitability of grasscutter farming business.
Keywords: Determinants, Profitability, Grasscutter, farming, South East

INTRODUCTION

Grasscutter *(Thryonomys Swinderianus)* farming is one of the fastest growing parts of the agribusiness sector of Nigeria. It is driven by high income growth and supported by technological and structural changes. Grasscutter farming is also crucial to the development of the national economy in view of its contributions to the gross domestic product (Owen and Dike, 2010). The growth and transformation of the sector offer opportunities for agricultural development, poverty reduction and food security (Uddin and Osasogie, 2016).

According to Yazdanfar (2013), one of the important preconditions for long-term firm survival and success is profitability. By knowing and understanding the cost and return give the needed feedback for the business (Schiniotakis, 2012). Domestication of grasscutter requires less space and less capital (Agwunobi *et al*, 2009). It can be raised in backyards, within limited space by landless farmers. The market for both fresh and smoked grasscutter meat as well as its contribution to per capita income is high. The meat quality is leaner and non-cholestrogenic (Bello *et al*, 2011). The

meat is very tasty when compared with both domestic and familiar game species. The hair of the grasscutter is used to season food just as much as its stomach and intestine contents. The pancreas of the grasscutter contains a high concentration of insulin which is used for local preparation for the treatment of diabetes (Bello *et al*, 2012).

Furthermore, it has also been noted that grasscutter breeders generally earn two times more than what they invested in the grasscutter husbandry (Sodjinou and Mensah, 2005). Domestication of grasscutter therefore serves to generate income and reduce hunting. Thus, understanding the determinants and performance of grasscutter enterprise is the key factor that help Grasscutter enterprises in developing an effective profitability strategy for their business. The specific objectives are to;

i. examine the profitability of grasscutter production
ii. estimate the determinants of profitability of grasscutter production in South East Nigeria.

METHODOLOGY

The study was conducted in South Eastern Nigeria. The Zone consists of five states, namely, Abia, Anambra, Ebonyi, Enugu, and Imo. According to NBS (2019), the population of the South East Zone is 23,053,581. A multi-stage sampling technique involving purposive selection of the States, Agricultural Zones and grasscutter enterprises were used for this study. The first stage involved purposive selection of three states (Abia, Imo and Ebonyi) for the study. The second stage involved selection of three Agricultural Zones from each of the selected states. Then, purposive selection of three Local Government Areas from each Agricultural Zone. This implied a total of 27 LGAs These Local Governments representing the sampling frame and Agricultural Zones from the three states were selected because they were found to have high level of grasscutter farming activities. The fourth stage involved the purposive selection of 3 grasscutter enterprises (respondents) from each of the selected LGAs of the three States; A total of 81 grasscutter enterprises (respondents) were selected for the study. The primary data were obtained through aid of questionnaire and interview schedule.

To examine the profitability of grasscutter farming business was achieved using a number of profitability indicators.

a. Profitability ratio:

i. Net profits to total assets $= \frac{Net\ returns}{Total\ assest}$ (1)

ii. Net profit to total sales (%) $= \frac{Net\ returns}{Total\ sales} \times 100$ (2)

iii. Net returns per naira of investment $= \frac{Gross\ returns}{Total\ cost}$ (3)

iv. The net profit:

$$\pi = TR - TVC - TFC \quad (4)$$

$$\pi = \sum_{i=1}^{m} P_i Q_i - \sum_{i=1}^{n} r_i x_i - P_k C_K \quad (5)$$

Where,

π =profit

P_k= price of fixed inputs

C_k= vector of fixed inputs

v. Returns on sales (ROS):

$$ROS = \frac{NI}{NS} \quad (6)$$

Where,

NI = Net Income of firm

NS = Net Sales of the average firm

vi. Return on Investment (ROI):

$$ROI = \frac{Net\ Return\ per\ annum}{Total\ cost\ incurred\ per\ annum} \quad (7)$$

vii. Gross profit to Sales (GS):

$$GS = \frac{Gross\ profit\ (GP)}{Sales} \quad (8)$$

b. Turnover ratio

Working capital turnover $= \frac{Gross\ returns}{Total\ working\ capital}$ (9)

Total asset turnover $= \frac{Gross\ returns}{Fixed\ assest}$ (10)

c. Efficiency ratio

Gross ratio (%) $= \frac{Total\ expenses}{Gross\ income} \times 100$ (11)

Operating ratio $= \frac{Operating\ expenses}{Gross\ income} \times 100$ (12)

d. Solvency ratio:

Fixed asset to owned fund $= \frac{Fixed\ assets}{Owned\ fund}$ (13)

The determinants of profitability of domestic grasscutter farming business in the study area was achieved using ordinary least square (OLS) regression specified as:

$$Y_i = f(X_1, X_2, X_3, X_4, X_5, X_6, X_7, X_8, X_9) \quad (14)$$

Where,

Y_i = Profit from ith grasscutter enterprise

X_1 = Age of business (years)

X_2 = Amount of Credit used (₦)

X_3 = Value of assets (₦)

X_4 = Stocking density (number of Grasscutter)

X_5 = Price of mature grasscutter (₦)

X_6 = Number of competitors (Number of grass cutter farmers in neighbourhood)

X_7 = Business location (urban=1, rural=0)

X_8 = Cost of medication and vaccination (₦)

X_9 = Interest expense and losses from disposing of fixed asset costs (₦)

Profitability of Grasscutter Production

Result in Table 1 showed that the average net return realized was ₦325,200.00. This was realized from sales of male (₦208,950) and female (₦116,250) grasscutters. From the Table, the average selling price of male (₦4,975) grasscutter was more expensive than the female grasscutter (₦4650). This is because male grasscutter has more economic value than female. The second phase of the Table showed that the total cost of production was ₦ 187,158.91 for an average grasscutter enterprise, with average variable cost accounting for 66.34% of total cost of production, while the fixed cost accounted for 33.665% of total cost of production. The Table further indicated the component of variable cost to include; grasscutter parent stock (₦75,000), forage/bundle (₦15,800), feed/salt (₦12,300), labour (₦15,511.50), association due (₦377.63) and drug/vaccines (₦5,180.00). The major component of fixed cost include; value of Fixed assets deposited in bank (₦44,085.64), Wheel barrow (₦7,555.39) and rent (₦1,654.14). While the net return for an average grasscutter enterprise was ₦138,041.09. This shows that the grasscutter enterprise is a high yielding venture indicating a positive net return.

Table 1: Profitability analysis of grasscutter enterprise in South East Nigeria Annual

Variables/Items	Quantity	Unit selling price	Average value (₦)	% of revenue
A. REVENUE				
Male grasscutter	42	4,975.00	208950	64.25
Female grasscutter	25	4,650.00	116250	35.75
Total return/revenue			325,200.00	100.00
B. COSTS				
Variable cost				**% of total cost**
Forage/bundle			15,800.00	8.44%
Feed/salt			12,300.00	6.57%
Labour			15,511.50	8.29%
Drug/vaccines			5,180.00	2.77%
Total variable cost			**48,791.50**	26.07%
Gross profit			**276,408.5**	
Fixed cost				**% of total cost**
Grasscutter parent stock			75,000.00	40.07%
Fixed assets deposited in bank			44,085.64	23.56%
Association/levies			377.63	0.20%
Depreciation of farm asset			18,904.14	4.04%
Total fixed cost			**138,367.41**	73.93%
Total cost			**187,158.91**	**100.00%**
C. PROFIT				
Net Return			**138,041.09**	
Gross profit to Sales (GS):			0.62	
D. PROFITABILITY RATIO				
Net profits to total asset			3.13	
Net profit to total sales (%)			42.45	
Net returns per naira of investment			1.07	
Returns on sales (ROS)			1.00	
Return on Investment (ROI):			1.73	
Benefit cost ratio (BCR)			1.74	
E. TURNOVER RATIO				
Working capital turnover			1.74	
Total asset turnover			5.16	
F. EFFICIENCY RATIO				
Gross ratio (%)			57.55	
Operating ratio (%)			38.18	
G. SOLVENCY RATIO				
Fixed asset to owned fund			0.19	

Source: Field Survey Data, 2020

Also, Table 1 showed the profitability ratio, turnover ratio and solvency ratio. The profitability ratio include; net profits to total asset (3.13), net profit to total sales (42.45%), net returns per naira of investment (1.07), returns on sales (0.42), return on investment (0.74), gross profit to sales (0.62) and benefit cost ratio (1.74). This indicate that grasscutter business is also profitable in the study area. A similar study by Aiyeloja and Ogunjimi (2013) revealed that grasscutter production in Osun state has the highest cost-benefit ratio of 3.64 which indicates good profitability level in the western states of Nigeria. The Turnover ratio include working capital ratio (1.74), total asset turnover (5.16). Efficiency ratio include gross ratio (57.55%) and operating ratio (38.18%) while

solvency ratio is 0.19. These results are in consistence with *a priori* expectation, because profitability as postulated by Upton (2010) is a basic stimulant to production as producers are encouraged by the level of performance in a particular enterprise or production system.
These are indications that grasscutter enterprises in the study area is economically viable since none of the ratios (profitability, turnover and efficiency) was below 1. The solvency ratio was 0.19 which implied that the grasscutter enterprises are solvent, that is they can pay-off their debt and still remain in business.

Determinants of Profit Of Grasscutter Enterprises
The results in Table 2 show the regression results for determinants of profit for the grasscutter enterprises in the study area. The semi log functional form for this study was chosen based on the economic, statistical and econometric criteria. Based on the criteria stated above semi-log functional form was chosen as the lead equation. R^2 value of 0.7168 implies that the specified explanatory variables explained about 71.67% of the total variables in profit. The F-statistic of 19.97 which is statistically significant at 1% probability level, indicate that the equation has goodness of fit.

Table 2: Regression analysis on determinants of profit of grasscutter enterprises

Variables	Linear	Exponential	Semi log (+)	Double log
Intercept	292107.3	7.62	4640736.00	30.43
	(1.85*)	(5.28***)	(3.08***)	(2.15**)
Age of business (X_1)	46268	0.23	290719.30	0.91
	(2.86**)	(1.61)	(2.97***)	(0.99)
Credit used (X_2)	46.21	0.00	294991.00	0.94
	(2.67***)	(1.38)	(2.98***)	(0.01)
Value of assets (X_3)	-1.74	-7.23e-06	-6181.583	-0.02
	(-1.42)	(-0.64)	(-10.91***)	(-0.46)
Stocking density (X_4)	-675.485	-0.00	-18841.33	-0.03
	(-1.60)	(-0.92)	(-1.53)	(-0.29)
Price of grasscutter (X_5)	5.98	0.00	152750.90	0.84
	(0.58)	(0.17)	(12.57***)	(0.73)
Competitors (X_6)	-21231.99	-0.17	-31148.8	-0.26
	(-2.68***)	(-2.40**)	(-1.98*)	(-1.78*)
Business location (X_7)	12584	0.40	8931.34	0.03
	(0.81)	(0.28)	(0.67)	(0.28)
Cost of medication (X_8)	-33.31	-0.00	-50056.42	-0.59
	(-4.09***)	(-4.84***)	(-3.23)	(-4.07)
Interest expense and losses from disposing of fixed asset (X_9)	-55.75	-0.00	-83775.27	-0.69
	(-5.87***)	(-5.02***)	(-8.78***)	(-7.68***)
R^2	0.6032	0.5607	0.7168	0.6682
R^{-2}	0.5529	0.5050	0.6809	0.6262
F-ratio	11.99***	10.07***	19.97***	15.89***

Source: Field survey data, 2020. Figure in parenthesis are the t-ratio. * ,**,***= Significant at 10%, 5% 1% , respectively. + lead equation.

Age of business was statistically significant at 1% and positively related to net returns and it has a positive coefficient. This implies that as age of business increases, the profit of the grasscutter enterprise also increases. Age of business may provide an indication, all things being equal, of the experience of the respondents over the years on grasscutter production and how to overcome inherent challenges and problems so as to maximize output. The positive impact resulting from the fact that the enterprise which has operated the business for longer period may take their decision more easily than the younger enterprise, because the older enterprise might have accumulated capital or a long term relationship with their clients or might have preferential access to credit due

to their age of business. This confirm with the findings of Owen and Dike, (2010) were they noted that as age of business increases, the profit of the grasscutter enterprise also increases.

The coefficient of amount of credit used was positive and highly significant at 1%, indicating that increase in the amount of credit used increase profit. The implication is that grasscutter enterprise with greater amount of credit are more likely to perform better in production than their counterparts who have low or no credit access. This result confirms the fact that credit contributed significantly in the profitability of grasscutter production function. The finding agrees with Abbas, *et al* (2005) who reported that increase in performance (profit) is a function of credit. Access to credit gives the farmer opportunity to enter into commercialization thereby earning more income for expansion. Access to credit increases the performance of the enterprise, expands firms and enables individual to acquire technologies; it also enables them to procure farm inputs and hire labour for enhanced profitability and income (Idu *et al.,* 2016).

Value of assets was negative and statistically significant at 1%. This is against *a priori expectation* because capital endowments like ownership of enterprise equipment have an impact on profitability. Ownership of equipment such as matchet, basin and wheelbarrow have a positive impact on the profitability by facilitating production to the enterprise.

The coefficient of price of mature grasscutter was statistically significant at 1% and positively related to profit; meaning that the price of mature grasscutter positively affects the level of profit. The positive sign of the coefficient revealed that as the selling price of matured grasscutter increases, the level of profit increases and vice versa. Grasscutters are not the most prolific of rodent species but the high demand, and the more attractive per unit market price than that of beef and the fact that it accounts for the greater proportion of bush meat sold in the markets makes grasscutters a suitable micro-livestock activity for income generation and increased profit.

The number of competitors was significant at 5% and negatively related to profit; this implies that the number of competitors in grasscutter enterprises in an area significantly affect profit: therefore, as number of competitors increase, the profit level also decreases. Competitors lead to surplus in the area and reduce revenue which lead to lower profit. If a competitive equilibrium exists, then the equilibrium is necessarily. Competition exerts downward pressure on costs, reduces slack periods and provides incentives for the efficient organization of production.

Furthermore, other costs (including interest expense and losses from disposing of fixed asset) negatively affect the level of profit. The negative sign of the coefficient revealed that as the other cost increases, the level of profit decrease and vice versa. This is in line with findings of Upton M. (2010), who reported that additional cost in business reduce the profit of the enterprise.

CONCLUSION AND RECOMMENDATIONS

The study therefore concluded that grasscutter farming is profitable based on the positive net return and significant variables that influence grasscutter farming. These include, age of business, amount of credit used, value of asset, Price of mature grasscutter, number of competitors and other cost. Government should ensure that farm inputs such as feeds/salt, drugs/vaccines, forage, are made available to the enterprises at a highly subsidized rate. Also, measures such as subsidies on input that will increase profitability of grasscutter farming business should be put in place by private individuals and government in order to encourage greater participation of enterprise in this professional endeavour.

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