



## Economic Analysis of Grass Cutter Raised In Captivity in Osun and Oyo State, Nigeria

Adewumi A.A.<sup>1\*</sup>, Famubo E.O.<sup>1</sup>, Ofuya E.E.<sup>2</sup>, Wahab M.K.A.<sup>1</sup>

<sup>1</sup>Department of Wildlife and Ecotourism Management, Osun State University, Osogbo, Nigeria

<sup>2</sup>Department of Ecotourism and Wildlife Management, Federal University Of Technology, Akure Nigeria

\*Correspondence author: [Abibay2001@yahoo.com](mailto:Abibay2001@yahoo.com)

Received: 11 May 2021 / Revised: 27 May 2021 / Accepted: 10 June 2021 / Published online: 10 June 2021.

**How to cite:** Adewumi A.A., Famubo E.O., Ofuya E.E., Wahab M.K.A. (2021). Economic Analysis of Grass Cutter Raised In Captivity in Osun and Oyo State, Nigeria, Scientific Reports in Life Sciences 2(3), 1-7. DOI: <http://dx.doi.org/10.22034/srls.2021.531564.1019>

### Abstract

Grasscutters (*Thryonomys swinderianus*) are domesticated for meat, income generation, and other conservational purposes. This study focused on the socio economic characteristics of grasscutters raised in captivity and the profitability of its farming in Osun and Oyo state. Data were collected through direct observation of the farms and the use of structured questionnaire. Three (3) grass cutter farms each were randomly selected in Osun and Oyo state. Data was analyzed using multiple regression analysis. The results shows that majority (74.7%) of the respondents were male and married (66.7%). Ages 31-40 were more involved in the business and religion is not a barrier in raising the animal. Grass cutter farming proved to be a profitable business venture in both states; Oyo state NFI (NET FARM INCOME) = TR-TC which is 10,291,400 - 2,948,600 = 7,342,800, While in Osun state NFI=TR-TC = 23,205,500-3,264,500. However, low level of veterinary care, high rate of disease infection and marketing of the animals are the major constraint affecting grass cutter business in the study area. The study therefore concluded that grass cutter rearing is a profitable business and recommends that researchers should work more on the diseases affecting the grass cutter and the government should create training programmes for interested grass cutter farmers.

**Keywords:** Domestication, Farmers, Grasscutter, Profitable, Socio-Economic



## Introduction

Grasscutter (*Thryonomys swinderianus*) is a wild hystricomorphic rodent that is widely distributed in the African sub-region and exploited in most areas as the most preferred source of animal protein (Adu, *et al.*, 2017). Its potentials of as a source of animal protein for people in Africa, both urban areas and rural communities cannot be overemphasized (Adu, Asafu-Adjaye, Hagan and Nyameasem, 2017) as it is recognized as an important source of meat cherished because of its culinary properties with demand consistently outstripping supply (Adoma, 2009). Wildlife domestication has therefore been recognized as a way of achieving protein sufficiency in Africa (Ajayi, 2010) as rural communities in many parts of Africa, Asia, central Europe and the Americas are increasingly concerned about losing self-sufficiency as their local wild populations of animals used for bushmeat dwindle because the wildlife biomass of tropical forests is generally low (CBD, 2001).

The animal commonly lives among dense grasses mostly along river banks and swamp sand is rampant among herbaceous vegetation where there is a good cover. They do not dig burrows like other rats but they hide in holes and scrape a small saucer-shaped depression among the vegetation (Aluko *et al.*, 2015). This animal also known as greater cane rat is classified as a non-timber forest product (NTFP) that is tropical in distribution (Unaeze, 2016). It has great impacts on the livelihood of rural communities (Adedapo and adekunle, 2013).

Grasscutter farming is profitable because of its social acceptability, meat quality, inexpensive feed sources and amenability to captive rearing, good litter size and short generation interval (Agbelusi, 2013). Cane-rat meat has good nutritional qualities: high quality animal protein, low fat, high dressing percentage and good/unique taste (Unaeze, 2016). Being the most preferred and most expensive meat in West Africa including Nigeria, Togo, Benin, Ghana and Cote d'voire, it contributes to both local and export earning in most West African countries and is therefore hunted aggressively (Ibe, Ikpegbu and Nzalak, 2017).

Mustafa, Akinyemi, Adewale, Odeleye and Abdulazeez (2015) found out that grasscutter domestication is now on the increase because the meat is known to be popular especially in South-Western Nigeria and thus producing them under domesticated conditions in higher numbers would be a good source of supplementing the country's inadequate protein needs which is dependent on conventional livestock (Cattle, Sheep, Goats, Pigs and Poultry). The cost of establishing a grass cutter farm is relatively low and grasscutters are hardy animals. Its domestication requires less space and less capital. It can be raised in backyards within limited space by landless farmers (Adu, *et al.*, 2017). This study is therefore aimed to analyse the economics of grasscutter farming in the selected states.

## Materials and Methods

### Study Area

The study was carried out at grasscutter farms in Osun and Oyo state, Nigeria. Osun state lies between longitude 04°33'E and latitude of 07°28'N and covers an area of approximately 14,875km<sup>2</sup>, bounded by Ogun, Kwara, Oyo and Ondo states. Oyo state lies between longitude 03°00'E and latitude 07°00'N, bounded by Kwara on the north, Osun on the east, Ogun on the south and by Republic of Benin on the west. Osun state has an annual temperature of 26.1°C and about 1241mm of rainfall annually. While Oyo state has an average temperature of 26.5°C and about 1311mm of rainfall annually. The vegetation of southwest Nigeria is made up of freshwater swamp and mangrove forest at the coastal belt, the lowland rainforest stretches to Ogun and parts of Ondo State while secondary forest is towards the northern boundary where derived and southern Guinea savanna exist (Agboola, 1979)



### **Data collection and analysis**

The population for the study was grasscutter farmers in Osun and Oyo States respectively. The states were selected due to the prominence of grasscutter farming. One hundred and fifty (150) farms in Osun (50 farms) and Oyo (100 farms) state were selected randomly. The study was quantitative in nature involving a well-structured questionnaire administered on 150 grasscutter farmers in Osun and Oyo States. The questionnaire consisted information on respondents' socioeconomic characteristics and relevant information on grasscutter farming in Osun and Oyo states. The data obtained were subjected to both descriptive and inferential statistics. The descriptive statistics employed include mean, frequency and percentage. These were used to describe the socio economic characteristics of the respondent while the inferential statistic used was multiple regression analysis which was used to determine the socioeconomic determinants of grasscutter farming among the respondents.

### **Results and Discussion**

The socio-demographic characteristics of grasscutter farmers (Table 1) shows that majority 74.7%) of the farmers were male and within the active productive age of 31-40, corroborating the findings of Aiyelaja and Ogunjinmi (2013) stating that the male folks are more involved in grasscutter farming than the female. Majority (66.7%) of the respondents were married and are Christians (60%). The household size of majority (94.7%) of the respondents was 1-10, indicating that grasscutter farmers largely depend on family labour, confirming Unaeze (2016) assertion that family labour provides assistant for agricultural production. The level of education of respondents was very high as (88.7 %) had tertiary education. This suggests that the respondents are very knowledgeable and will be able to apply modern techniques in grasscutter production. The most utilised source of labour was hired labour (46.0%) which is inconsistent with Unaeze (2016) assertion that family labour provides assistant for agricultural production as only (16.0%) of the respondents depended on family labour. Furthermore, only (2.7%) of the respondents had more than 11years experience in grasscutter farming which could be an indication that majority of the respondent do not have sufficient grasscutter farming experience.

### **Housing, Acquisition, Patronage and Sales of Grass cutter by Respondents**

Majority (60%) of the respondents use cages as means of housing for their grass cutter farms because it is a cheaper way of housing the animal. Also, most of the farmers acquire their grass cutter by purchase (96.7%) and sell singly (36.7%) to the final consumers (50%).

### **Importance of Grasscutter farming to sustainable livelihood**

Table 3 shows that grass cutter farming is important to the sustainable livelihood of majority (85.3%) of the respondent. This implies that most of the respondents depend on grass cutter farming for their livelihood, while majority (50%) of the respondents indicated grass cutter farming to be profitable (Table 4), with only 2% indicating grasscutter farming not to be profitable.

**Table 1: Socio-Demographic Characteristics of Respondents**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Gender</b>		
Male	112	74.7
Female	38	25.3
<b>Age</b>		
20-30	56	37.3
31-40	71	47.3
41-50	18	12.0
51-60	5	3.3
<b>Marital Status</b>		
Single	46	30.7
Married	100	66.7
Separated	2	1.3
Divorced	2	1.3
<b>Academic Qualification</b>		
No formal education	1	0.7
Primary	9	6.0
Secondary	7	4.7
Tertiary	133	88.7
<b>Religion</b>		
Christianity	90	60.0
Islam	56	37.3
Traditional	4	2.7
<b>Household Size</b>		
1-10	142	94.7
11-20	8	5.3
<b>Farming Experience</b>		
1-10	146	97.3
11-20	4	2.7
<b>Source of Labour</b>		
Family labour	24	16.0
Hired labour	69	46.0
Self-labour	57	38.0

Field Survey, 2020

**Table 2: Housing, Acquisition, Patronage and Sales of Grass cutter by Respondents**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage (%)</b>
<b>Housing type</b>		
Cages	90	60.0
Hutches	60	40.0
<b>Grasscutter Acquisition</b>		
Purchase	145	96.7
Hunt	5	3.3
<b>Grasscutter patronage</b>		
Retailers	74	49.3
Consumers	75	50.0
Others	1	0.7
<b>Method of sale</b>		
Colonies	50	33.3
Single	55	36.7
Male and Female	45	30.0

Field Survey, 2020



**Table 3:** Importance of Grasscutter farming to sustainable livelihood

Variable	Frequency	Percentage
<b>Importance to livelihood</b>		
Important	128	85.3
Not Important	22	14.7

**Table 4:** Profitability of grass cutter farming

Variable	Frequency	Percentage
<b>Profitability of Grasscutter farming</b>		
Highly profitable	27	18.0
Profitable	75	50.0
Moderately profitable	45	30.0
Not profitable	3	2.0

**Economic Analysis of Grasscutter Farming for Osun and Oyo States**

The profitability of any business can be deduced from the relationship between the cost incurred in running the farm business and the returns according to Adegeye & Dittoh (1985). The costs and returns associated with grass cutter farming in the study areas (Oyo and Osun State) is shown below in Table 5. The total cost of grass cutter rearing is Osun state and Oyo state is 3,264,500 and 2,948,600 respectively. The total fixed cost which was 752,000 at 27.58% and 835,000 at 28.31% respectively, the total variable cost was 2,512,500 represented of total cost 71.95% and 2,948,600 at 71.68% respectively for Oyo and Osun state. Feed costs were the most important cost factors in grass cutter rearing accounting for about 38.15% and 38.09% respectively for Osun and Oyo state. However the total revenue was 29,205,500 and 10,291,400 respectively for Oyo and Osun State while the net farm income was 19,941,000 and 7,342,800 respectively. The result showed that grass cutter rearing is profitable.

**Table 5:** Annual cost and Return Analysis for Osun and Oyo States

S/N	Item	Osun Average Value (N)	Scale	Oyo Average Value (N)	Scale
A	<b>Total Revenue (TR)</b>	23,205,500		10,291,400	
B	<b>Variable Cost (VC)</b>		<b>% of TVC</b>		<b>% of TVC</b>
	Cost of feed	1,245,500	38.15	1,123,100	38.09
	Cost of Purchase	712,000	21.81	639,500	21.69
	Cost of Hired labour	555,000	17.00	351,000	11.09
C	<b>Total Variable Cost (TVC)</b>	2,512,500	76.96	2,113,600	71.68
D	<b>Fixed Cost (FC)</b>		<b>% of TFC</b>		<b>% of TFC</b>
	Building/Purchase of Hutch/Cage	752,000	23.04	835,000	28.31
E	<b>Total Fixed Cost (TFC)</b>	752,000	23.04	835,000	28.31
F	<b>Total Cost (TC) = TVC + TFC</b>	3,264,500	100	2,948,600	100
G	<b>Gross Margin = TR - TVC</b>	20,693,000		8,177,800	
H	<b>Net Farm Income (NFI) = TR – TC</b>	19,941,000		7,342,800	

**Grasscutter Farming Constraints**

The most prevailing constraints encountered by the respondents during production include; high rate of disease infection (81.3%), low level of veterinary care (76.7%), marketing the animal (56.0%) and poor pricing of animal (37.3%). Also, only 35.3% of the respondents indicated that grasscutter farming is capital intensive which affirms Adu, *et al.* (2017) report that domestication requires less space, less capital and can be raised in backyards within limited space by landless farmers. Other less prevailing



constraints experienced by the farmers included, theft (20.7%), requirement of technical know-how (14.0%), stressful routine management and care (14.0%), and high cost of feed (12.0%) (Table 6).

**Table 6:** Grass cutter Farming Constraints

Constraints	YES Frequency	NO Frequency
Capital intensive	53 (35.3)	97 (64.7)
Require Technical Know-how	21 (14.0)	129 (86.0)
Marketing	84 (56.0)	66 (44.00)
Cost of Feed	18 (12.0)	132 (88.0)
Poor price of animals	56 (37.3)	94 (6.27)
Theft	31 (20.7)	119 (79.3)
High rate of disease infection	122 (81.3)	28 (18.7)
Low level of veterinary care	115(76.7)	35 (23.3)
Stressful routine management	21 (14.0)	129 (86.0)

**Determinants of Grasscutter Farming Profitability**

The regression analysis results show that there is a positive relationship between age of respondents and their level of profit. This implies that age has an effect on profit. Age is statistically significant. There is a negative relationship between genders of the respondents with their level of profit. This implies that gender does not affect the profitability of Grasscutter production. There is a positive relationship between the educational qualification of the respondents and their level of profits. This implies that the more educated the respondents are the higher the profit. Educational qualification is not statistically significant. This means educational qualification influences the profits of the respondents. There is a positive relationship between cost of hired labour and the profits. This implies that a reduction in the amount spent on hired labour would increase the profits of the farmers by ₦0.09. There is a positive relationship between the cost of purchase of the animals by the respondents and their level of profit. This implies that a reduction in the amount spent on the purchase of the animals would increase the profits of the respondents by ₦0.38. Cost of purchase is not statistically significant. Also, there is a positive relationship between the cost of feed and the level of profits of the respondents which implies that a reduction in the amount spent feed would increase the profits of the farmers by ₦0.41. There is a positive relationship between the cost of hutches and cages and the level of profits of the respondents. This implies that a reduction in the amount spent on hutches and cages would increase the profits of the respondents by ₦0.71. The cost of hutches and cages is statistically significant at 10% this means the cost of hutches and cages has an influence on the respondents profits (Table 7).

**Table 7:** Regression result for grasscutter production for Osun State

Variables	Coefficients	t-values	P-Value
Age	0.23	2.82	0.01**
Gender	-0.13	-0.30	0.77
Educational qualification	0.64	1.04	0.41
Cost of Hired Labour	0.09	0.18	0.86
Cost of Purchase	0.38	0.99	0.32
Cost of Feed	0.41	2.77	0.01**
Cost of Hutch and Cage	0.71	2.62	0.01**
Constant	12.63	1.04	0.30

R<sup>2</sup> = 0.65 Adjusted R<sup>2</sup> = 0.50 \*P<0.01



## Conclusion

Grass cutter farming proved to be a profitable business venture as individuals of different ages and religion are involved in grass cutter farming. The domestication of grasscutter domestication was influenced by respondents' age, household size, income and years of farming experience. However, low level of veterinary care, high rate of disease infection and marketing of the animals are the major constraint affecting grasscutter business in the study area.

## References

- Adu, E. K., Asafu-Adjaye, A., Hagan, B. A. and Nyameasem, J. K. (2017). The grasscutter: an untapped resource of Africa's grasslands. *Livestock Research for Rural Development* Volume 29, Article #47
- Agbelusi, E. A. (2013). Some aspects of the ecology of the grasscutter (*Thryonomys swinderianus*) and its management implications. Ph.D Thesis Dept. of Wildlife and Fisheries. Federal University of Technology Akure, Nigeria. pp. 171.
- Agboola, S. A. (1979) "An Agricultural Atlas of Nigeria", Oxford University Press, Nigeria, 248Pp, 1979
- Aiyelaja, A. A and Ogunjinmi, A. A. (2013). Economic aspects of Grasscutter farming in South Western, Nigeria: Implications for Sustainable Adoption and Conservation, *International Journal of Scientific and Engineering Research*, 4(10), 17-23.
- Aluko, F., Salako, A., Ngere, L. and Eniolorunda, O. (2015). A review of the habitat, feeds and feeding, behavior and economic importance of Grasscutter farming. *American Journal of Research Communication*, 3(9), 96-107.
- CBD (2001) Secretariat of the Convention on Biological Diversity, "Sustainable management of non-timber forest resources". Montreal, CBD Technical Series no. 6, 30Pp. 2001
- Ibe, C.S, IKpegbu, E and Nzalak, O (2017). Relationship between age and brainstem allometry in African grasscutter (*Thryonomys swinderianus* Temminck), *Journal of the South African Veterinary Association*, <https://jsava.co.za/index/php/jsava/article/view/1481/1926>
- Mustafa, M. O, Akinyemi, I. G, Adewale, M. I, Odeleye, O. A and Abdulazeez, F. I (2015). Comparative Assessment of Growth structure and litter size of Grasscutter (*Thryonomys Swinderamo* Temminck, 1872) Bred in Captivity, *Journal of Natural Sciences Research*, 5(15),
- Unaeze, H.C. (2016). Determinants of Grasscutter (*Thryonomys swinderianus*) Production in Ughelli North Local Government of Delta State, Nigeria. *Applied Tropical Agriculture*, 21(3), 209-214.