Journal of Research in Forestry, Wildlife & Environment Vol. 13(1) March, 2021
***E-mail:** jrfwe2019@gmail.com; jfewr@yahoo.com*
http://www.ajol.info/index.php/jrfwe

ISBN: 2141 – 1778
Odunlami and Nkata, 2021

CONTRIBUTIONS OF GRASSCUTTER *(Thryonomis swinderianus)* HUNTING TO THE LIVELIHOOD OF COMMUNITIES IN ABI LOCAL GOVERNMENT AREA, CROSS RIVER STATE, NIGERIA

*** Odunlami, S. S. and Nkata, J.E.**
*Department of Forestry and Wildlife Management, University of Port Harcourt
Corresponding author: *samuel.odunlami@uniport.edu.ng;* +2348153644501

ABSTRACT

The study assessed the contributions of Grasscutter (Thryonomis swinderianus) hunting to the livelihood of communities in Abi Local Government Area, Cross River State, Nigeria. Data were collected through the administration of a set of self-structured questionnaires, interviews, group discussion and personal observation. Multistage sampling technique was used for the study. In the first stage, six communities noted for high concentration of grasscutter population were selected, namely Adadama, Ebom, Ekureku, Igbo Imabana, Itigidi and Usumutong. In the next stage, fifteen hunters who engaged in grasscutter hunting were randomly selected from each of the six communities and fifteen questionnaires were thereafter administered on them. In all a total of 90 questionnaires were administered for the study. Data collected were analyzed using descriptive statistics in form of frequency, tables and percentages. Budgetary Techniques and Net Bushmeat Income models were used to assess the performance level of the respondents. Most respondents 87.8% agreed that grasscutter hunting contribute to their family well-being, 17.8% use grasscutter as source of protein and 16.7% consume grasscutter for food. Additionally, most respondents (90.0%) agreed that grasscutter hunting is a profitable venture. Hence, 62.2% of the respondents engaged in grasscutter trade. Result from the study shows that hunters make profits from grasscutter hunting with gross margin of ₦36,000 and Net bushmeat income of ₦17,500 monthly. In other to sustain availability of grasscutter and to boost local economy, grasscutter domestication should be encouraged in addition to hunting from the wild.

Keywords: Abi Local Government, grasscutter, hunting, income, local economy

INTRODUCTION

Grasscutter (*Thryonomys swinderianus*) also known as Cane rat is widely found in grass land, wet lands or marshy areas. They belong to the family Thryonomydae and there are two major subspecies popular in West Africa and include *Thryonomys Swinderianus*, the larger grass cutter and *thryonomys gregarianus*, the lesser grasscutter (Asibey and Eyeson, 1973; Clottey, 1981; Aluko, et al., (2015). The male grasscutter is known as buck, while the female is called Doe Weighing 2 to 4kg compare to the buck that weighs between 4 to 6kg (Baptist and Mensah, 1986; Jorie *et al.*, 1995). They are considered delicacy and highly prized source of protein (Yeboah and Adamu, 1995; Aluko et al., 2015). The business of grasscutter is growing rapidly due to high patronage from residents of semi urban areas and residents of big cities around Africa who highly cherished grasccutter meat. Grasscutter plays important role in traditional African medicine such as preparation of concoctions for fertility. In Ghana, grasscutter hair and intestine contents are used for seasoning food. Also, the pancreas of grasscutter is used for local preparation for the treatment of diabetes because of its high

concentration of insulin (Igene, 1992; Bello *et al.,* 2012). Consequently, there is an increase in the quest for grasscutter for different purposes. Grasscutter have been used as source of protein across many African countries especially in the rural areas of West Africa (Okanlawon *et al.*, (2019). Also, many rural dwellers in Nigeria depend on nature for their livelihood including hunting of grasscutter (*Thryonomys swinderianus*).

The preference for grasscutter meat among other game animals, makes it commercially viable and widely accepted (Baptist and Mensah, 1986; Fonweban and Njwe, 1990). Hunting and gathering of wild animals have always been and continue to be an important aspect of life in rural African societies. In the past, hunting provided the main source of animal protein and traditional hunters are highly respected in the society. Even in modern day Africa, the Bushmen in southern Africa depend almost entirely on wildlife hunting and gathering to obtain essential protein and cash income, while many other groups supplement their livelihood considerably by hunting (Okanlawon *et al.,* (2019). However, over harvesting of wildlife species is generally perceived as a major threat to wildlife population and conservation especially in tropical countries where wildlife meat is used to augment meat and protein supply. Abi Local Government Area (LGA) is popularly known in Cross Rivers State and indeed Nigeria, as an area where grasscutter flourishes because it provides quality natural habitat for grasscutter to thrive. However, there is dearth of information in the literature about the exploitation and harvesting of grasscutter in Abi Local Government Area (LGA) of Cross River State. It is also on record that unregulated wildlife extraction in Africa is exceptionally high and West Africa in particular is noted for severe hunting of game animals (Oates et al., 2000; Brashares *et al.,* 2001). As a component of small and medium wildlife enterprise, wildlife hunting and gathering are overwhelmingly informal and remain largely unregulated.

Grasscutter hunting is one of the major survival strategies by many people in the rural areas that are naturally endowed with abundant grasscutter population. Though, grasscutter hunting and related activities in the local government is high. However surprisingly, these activities are not formal or legal and information on the different forms of utilization of grasscutter in Abi Local Government is not known. This lack of knowledge is a significant obstacle to effective grasscutter conservation and sustainable management policies which require a comprehensive understanding of grasscutter harvesting. This study was carried out to determine the contributions of grasscutter hunting to the livelihood of the local residents, determine different forms of utilization of grasscutter and the perceived status of grasscutter in Abi Local Government area of Cross River State.

MATERIALS AND METHODS

Study Area

This study was carried out in Abi Local Government Area (LGA) of Cross River State. Abi LGA covers an area of about 282km^2, it is located between latitudes 5.76^0 and 6.02^0 N and Longitudes 7.93^0 E and 8.71^0 E (Ebong et al., 2014) with Itigidi being the local government headquarters. Abi LGA is situated in the Central Senatorial District of Cross River State and occupies about shares boundaries with Yakurr LGA to the South, Biase LGA to the West, Obubra LGA to the East, and Ikwo and Onitcha LGAs of Ebonyi State to the North (Inah *et al.,* 2017).There are 10 political wards in Abi LGA with an estimated population of 218, 734 persons (NPC, 2010). Abi LGA is made up of rural settlements dominated by farmlands having two seasons, dry and wet seasons. The wet season usually starts from April with a short break in August and stops by mid-October. It has an average annual precipitation of over 2200 mm. with an annual temperature

between 23 ^{o}C and 27 ^{o}C in the rainy season which increases to about 35 ^{o}C in the dry season. The average relative humidity for the area is about 88% (Akpan et al., 2013). At the peak of the rainy season, the water levels in the major drain (Cross River) typically overflows its banks (Ebong et al, 2014). The soil is regularly wet and marshy during the rainy season but dry with deep pressure cracks during the dry season (Egboka and Uma, 1986). Abi LGA is very popular for high concentration of Grasscutter in Cross River State. The vegetation of Abi is made of moist giant grasses and tree species such as like *Khaya senegalensis, Terminalia ivorensis, Arzadiractha indica,* and *Astonia bunel* (Ebong et al, 2014).

Data collection

Data was collected through the administration of semi-structured questionnaires, group discussions and personal observation. The completion and retrieval of questionnaires were done on the spot. The literate respondents completed their questionnaires themselves, while the illiterate respondents were aided by interpreting each question and ticking as appropriate.

Sampling Technique

The sampling population was restricted to hunters. Multistage sampling technique was adopted for the study. In the first stage, six communities notable for high concentration of Grasscutter (*Thryonomys swinderianus*) in Abi LGA were selected for sampling namely; Adadama, Itigidi, Ebom, Ekureku, Igbo Imabana and Usumutong. Thereafter, fifteen hunters each from each of the selected and who have lived in these communities for a minimum of five years were randomly selected and questionnaire administered on them. In all, a total of 90 questionnaires were administered for the study.

Data analysis

The data collected from this study were analyzed using the SPSS package and were processed into suitable form for statistical analysis and were presented in form of tables, frequencies, percentages, pie charts and bar charts. Budgetary techniques and Net Bushmeat Income (NBI) models as adopted by Oduntan, et al., (2016) were used to assess the performance level (profit wise) of the respondents. Budgetary techniques were used to determine the gross margin and net bushmeat income obtained from grasscutter hunting in the study, using equations 1 to 3.

GM = TR – TVC …… (1)
NBI = GM – TFC …… (2)
Profit = TR – TC …….…. (3)
Where
GM = Gross Margin
TR = Total revenue
TVC = Total Variable Cost
NBI = Net Bushmeat Income
TFC = Total Fixed Cost
TC = Total Cost

RESULTS

Table 1 presents the perceived contribution of grasscutter to the livelihood of the people. Most respondents (87.8%) agreed that grasscutter hunting contribute to their family well-being while 6.7% claimed it did not.

Table 1: Perceived contribution of grasscutter to the livelihood of respondents according to respondents

Does grasscutter add to family livelihood	Frequency	Percentage (%)
Yes	79	87.8
No	6	6.7
No response	5	5.5
Total	**90**	**100**

Table 2 presents the level of demand for grasscutter in the study area. The table shows that 94.9% of the respondents claimed that grasscutter is in high demand while 2.2% indicated it is in low demand.

Table 3 shows the Gross margin and Net Bushmeat analysis. The Table shows that hunters made profits from grasscutter hunting with gross margin of ₦36,000 and Net bushmeat income of ₦17,500 monthly.

Table 4 presents the perceived profitability of grasscutter hunting. The table shows that 90.0% of the respondents agreed that grasscutter hunting is profitable and 5.6% did not agree that it is profitable.

Table 2: Perceived level of demand for grasscutter in the study area according to respondents

Demand for grasscutter	Frequency	Percentage (%)
High	85	94.5
Low	2	2.2
No response	3	3.3
Total	**90**	**100**

Table 3: Gross Margin and Net Bushmeat Income Analysis

Items	Cost (₦)
Total Revenue	**45,000**
Variable Cost	
Transportation	3,000
Ammunition (Bullet)	6,000
Total Variable Cost	**9,000**
Gross Margin	**36,000**
Fixed Cost	
Dane Gun (Locally Produced)	17,000
Cutlass	1,000
Knife	500
Total fixed Cost	**18,500**
Net Bushmeat Income	**17,500**

Figure 1: presents different forms of utilisation of grasscutter in the selected communities. From the table, majority of the respondents (64.5%) noted that they engage in grasscutter trading. Also, 17.8% use it as source of protein and 16.7% use it as food.

Figure 2 shows the perceived population status of grasscutter in the study area by respondents. The figure shows that 88.9% perceived that the population of grasscutter is declining in the study area while 7.8% were of the opinion that the population of grasscutter is increasing.

Table 4: perceived profitability of grasscutter hunting by respondents

Grasscutter hunting is profitable	Frequency	Percentage (%)
Yes	81	90.0
No	5	5.6
No response	4	4.4
Total	90	100

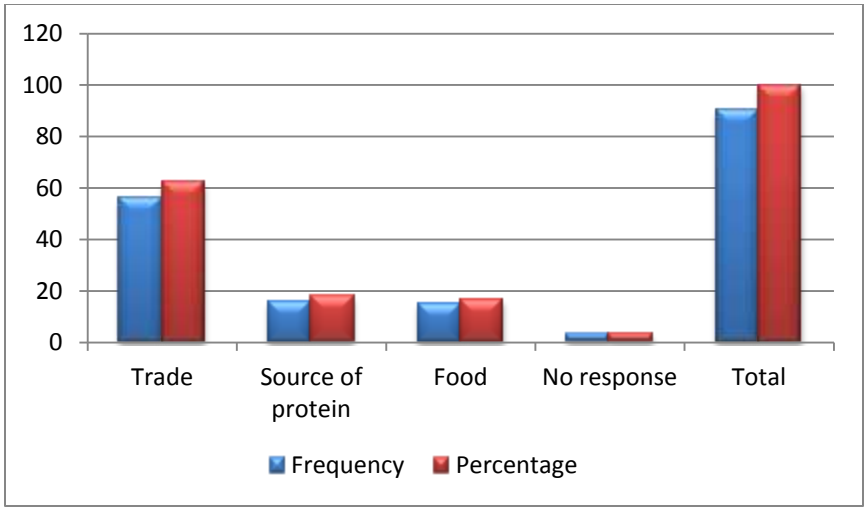

Figure1: Different forms of utilisation of grasscutter in the study area by respondents

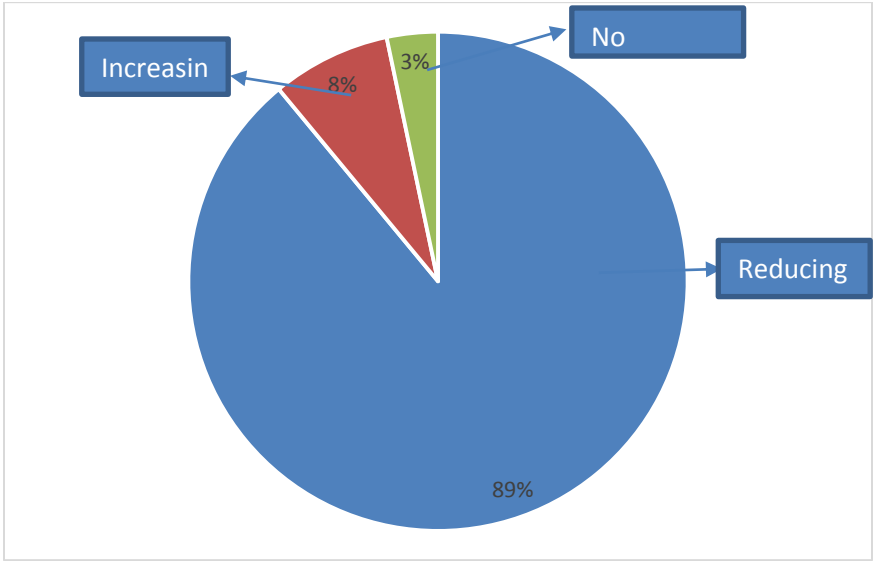

Figure 2: Perceived population status of grasscutter in the study area by respondents

Table 5 presents the perceived factors responsible for the declining population of grasscutter in the study area. According to the table, 67.8% of the respondents attributed the declining population of grasscutter to increasing human population and 22.2% attributed it to habitat destruction.

Table 5: Perceived factors for the declining population of grasscutter in the study area

Variables	Frequency	Percentage %
Increasing human population	61	67.8
Habitat destruction	20	22.2
No response	9	10.0
Total	90	100

DISCUSSION

Abi LGA is well known for the abundance of grasscutter in Cross River State due to inherent ecological parameters operating in the area which tend to favour the proliferation of grasscutter population. Consequently, many local residents in the study area engage in grasscutter hunting as a veritable source of earning a living. Most respondents interviewed for the study claimed that grasscutter hunting contributes to their family livelihood (Table 1) by enhancing their family income generation. Many urban residents both indigenes and non-indigenes regularly patronise the study area to purchase either live or roasted grasscutter meat either for their personal consumption or as gifts to their friends upon their return to the city. This in addition to increasing local residents' demand, have contributed to high demand (Table 2) for grasscutter in the study area and have contributed significantly to boosting the local economics. Moreover, these have also provided tremendous economic advantage to grasscutter hunters to earn an income from grasscutter hunting thereby improving their economic conditions. Oduntan, *et al.*, (2016) similarly reported that wildlife trade assists rural economics. According to them, wildlife trade provides source of income for rural communities who have few opportunities for earning money and the income generated is used to meet their family daily needs. Using ₦3000 as the mean price for a matured grasscutter and 15 as a mean monthly catch by respondents. Hence, grasscutter hunters could make profits from grasscutter hunting with gross margin of ₦36,000 and Net bushmeat income of ₦17,500 monthly which could guarantee a good living condition for an average rural family. This shows that grasscutter hunting is a profitable venture in the study area. The result of the study agrees with previous study by Aiyeloja and Ogunjimi (2013) who similarly reported that grasscutter business is profitable with a matured one been sold between ₦3,000 and ₦5000 in South-western Nigeria. Hence, the demand for grasscutter is very high in the study area as indicated by 94.5% of the respondents. Consequently, majority of respondents (90.0%) agreed that grasscutter hunting is profitable as indicated in Table 4. Additionally, from the discussions held with the respondents, many of them claimed that most of what they have been able to achieve in life was made possible through the income generated from selling hunted grasscutter. The result of this study clearly indicates that grasscutter hunting have significantly impacted on the livelihood of many residents in the study area. It has helped many residents to live well above poverty level enabling them to attain an improved standard of living comparable to many urban residents.

The result of the study also shows that grasscutter is utilized for different purposes in the study area according to household respondents. Most respondents (62.2%) claimed that grasscutter is utilized for trading particularly between the grasscutter hunters and middle men who often re-sell it to others who might process it for other purposes either as grasscutter pepper soup or as roasted bushmeat. The profit generated from the sale of grasscutter is used to boost their family income. Grasscutter hunters prefer to sell their catch and use the income generated to buy household items including food items. Opara, (2010) also noted that grasscutter meat actually dominates the bush meat trade in many West African countries due to its preference and patronage by both urban and rural residents. Also, Mc Namara , et al.,(2016) affirm that trade in wildlife and wildlife products is an important source of income for many poor people and could be the only source of income for many residents in rural areas of tropical rainforest. Bushmeat (including grasscutter), have been providing livelihoods for hunters, traders and sellers, and as source of protein to many rural and urban residents for several years in sub-

Sahara Africa particularly in West Africa (Mc Namara, *et al*.., 2016).

Similarly, according to Baptist and Mensah, (1986) and Ntiamo-Baidu, (1998), the grasscutter dominates the bush meat trade and grasscutter contributes to both the local and export earnings of many West African countries. The international, regional, and local trade interest in the grasscutter meat provides economic bases for the development of the grasscutter industry (Opara, 2010). Ntiamo-Baidu, (1998), also reported that due to the contributions of grasscutter meat trade to the Ghanaian economy, Ghana Export Promotion Council (GEPC) included the grasscutter meat on the non-traditional export trade of the country. Additionally, 17.8% of the respondents claimed they utilized grasscutter as source of protein (Figure 1). This agrees with the report of Ogunsanmi *et al*., (2002) who similarly noted that grasscutter is a major and steady source of animal protein in many rural communities in Nigeria, Togo, Ghana, Cote D' voire and Benin. This is particularly due to the fact that grasscutter meat has high protein and lower fat contents in comparison with meat from cattle, sheep and goat and for its tenderness and taste as reported by Asibey (l974). Moreover, Ajayi, (1971) and Den Hartog and de Vos, (1973) also reported that grasscutter meat has higher protein, calcium, phosphorous and moisture contents but lower fat content than beef, mutton, pork. These qualities endear grasscutter meat as a choice meat for many people including patients with cardiac problems (Opara, 2010). It is very apparent that grasscutter is indeed vital in the life of many residents in the study area. Its utilization for different purposes by the residents in the study area is an affirmation that grasscutter is vital for their survival because many residents in the study area depends on it for critical aspects of their lives.

Although, grasscutter meat is the most accessible bushmeat to most residents in the study area. However, majority of the respondents shows serious concern regarding the current population status of grasscutter in the study area during the discussion sessions held with them. This was also reflected in the questionnaire survey as shown in Figure 2 where majority of the respondents agreed that the population of grasscutter is decreasing in the study area. The declining grasscutter population according to most of the respondents could be attributed to increased human population in the study area. Increase in human population in the study area has resulted in corresponding rise in demand for grasscutter. Similarly, increase in human population in the study area has also resulted in increased demand for land use for other purposes such as farming, provision of infrastructural facilities such as schools, accommodation facilities, hospitals and roads. In order to provide these facilities, forest must be cleared. Consequently, forest degradation and wildlife habitat destruction were very noticeable in the study area. The forest where grasscutter formerly roam about freely in the wild which also serves as their habitat are now being depleted rapidly leading to decrease in grasscutter population. This agrees with the observation of Odonkor, *et al.,* (2007) who similarly reported that increase in human population has contributed to pressure on wildlife habitat and over-harvesting. This obviously portends great danger to grasscutter population and conservation in the study area as well as threats to local and global biodiversity.

Moreover, some of the respondents actually affirmed during discussions that more people now engage in grasscutter hunting because it is lucrative. More so, there is no regulation whatsoever regarding entrance into grasscutter hunting in the study area. Therefore, entrance into grasscutter hunting is free and open. This however, has adverse

implications on the number of catch per individual hunters since there are more people joining the grasscutter hunting while the population of grasscutter is already dwindling due to reduction in grasscutter habitat. Hence, majority of the grasscutter interviewed complained that the number of grasscutter catch has reduced drastically in recently when compared to the number of catches about ten years ago. This can also be as a consequence of lack of alternative job opportunities for youths currently been experienced in the country at the moment. Therefore, high demand for grasscutter due to increased human population, profitability of grasscutter hunting and ease of entrance into grasscutter hunting have influenced many residents in the study area to engage in grasscutter hunting. These in addition to grasscutter habitat destruction have greatly contributed to the declining grasscutter catch recently being experienced in the study area.

CONCLUSION

This study revealed that grasscutter hunting contributes significantly to the livelihood of the local residents in the study area because many of the local residents generate income from grasscutter which is used to take care of their daily responsibilities enabling them to live above poverty level. Grasscutter hunting has also empowered many people in the study areas by providing job opportunities for many unemployed local residents. Grasscutter is utilized for diverse purposes, such as serving as the source of meat, protein, trade and income generation. This clearly shows that grasscutter plays significant roles in the survival of many residents in the study area. However, the survival of grasscutter in the study area is under serious threat and could be completely wiped out from the wild very soon if nothing is done to its extinction. The current rate of grasscutter hunting is unsustainable as it is highly unregulated in the study area. In addition, loss of grasscutter habitat to other land use forms such as agriculture, urbanization and over exploitation are the processes that could result in accelerating the extinction of grasscutter in the study area. There may be loss of grasscutter and its contributions to the well-being of the residents in the study area if the current trend of hunting continues and the rate of grasscutter habitat destruction is not averted. This will be catastrophic considering the immense contributions of grasscutter to the livelihood of the residents in the study area. In order to avert extinction of grasscutter in the study area, the following recommendations are made:

Recommendations

(i) The local authorities should put in place legal and institutional frameworks to protect both flora and fauna species from local extinction through enactment of enforceable laws on wildlife habitat protection.
(ii) Public education in Abi communities to create awareness on the impact of grasscutter over exploitation and the need to halt the rapid destruction of grasscutter habitat should be aggressively pursued.
(iii) Creation of alternative livelihood for grasscutter hunters such as animal husbandry.
(iv) Certain portion of the land in the study area should be deliberately left untouched for wild grasscutters to thrive.
(v) Domestication of grasscutter should be aggressively pursued in the study area to meet current demand.

NOTE: All journal names should be written in full

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