

Evaluation of Cattle Menace on Forest Plantations in South-East Nigeria: A Case Study of Ohaji/Egbema Local Government Area of Imo State

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Abstract— This study was carried out to evaluate cattle menace on forest plantations in Ohaji/ Egbema Local Government Area of Imo State, South-East Nigeria. Data were collected using well structured questionnaires to elicit information from respondents in the study area. One hundred and twenty (120) respondents were randomly selected from a list 1200 foresters/farmers obtained from the different village leaders in the community. Data gotten were analyzed using descriptive statistics such as means, frequency distribution and percentages and likert-type scale. The study showed that 85.8% of the respondents were full time farmers. Others are traders (7.5%), civil servants (6.7%) though farming is their part time jobs. The study further showed that breadfruit (20%), oil bean (50%), bamboo (30.8%) and palm tree (50%) plantations, were the major plantations in the study area. Likert scale analysis indicated that chopping off of leaves (3.5), chopping off of the growing stems (3.5), instant death (3.0), debranching (3.3), destruction of young shoots (3.3), trampling on food crops (3.4), trampling on tender seedlings and young trees (3.4), soil compaction (2.7), are the major effects of cattle menace on forest plantations. Furthermore, the likert scale analysis indicated that demarcation of cattle route (3.0), use of resistant varieties (3.0), establishing of grazing reserves (2.7), are the major strategies identified towards resolving cattle menace in the study area. This study helps to increase awareness among academicians, farmers, governments and other critical stakeholders on the need to take urgent steps by putting necessary measures in place to curtail and checkmate the menace caused by the uncontrolled and reckless grazing by herders in South-East Nigeria.

Keywords— Cattle menace, forest plantation, farmers, Imo State, Nigeria, Ohaji/Egbema, South-East.

I. INTRODUCTION

Forest plantation plays a vital role in economic development of any nation. The forest provides household food and shelter for the people [1]. Precisely, forest plantations around the world provide important sources of livelihoods for many of the rural poor, although people may not necessarily make use of the forest in the same way and on the same level. Angelsen and Wunder [1] put forward four dimensions along which forest benefits in rural livelihoods can be categorized and assessed: I. Look at groups of beneficiaries; II. Evaluate types of forest products and services; III. Distinction between high and low rent forest products; IV. Differentiate the role of forest benefits in the household economy or livelihood strategy (for example, subsistence use versus cash income; gap

filling versus regular use). Extent of resource management (that is, from pure forests/forest products). As a matter of fact, forest dwellers do represent the group with the highest level of forest dependency [2]. Forest dwellers depend heavily on forest resources for subsistence with hunting, gathering and shifting cultivation (that is, clearance of forest land for agricultural purposes) as main livelihood activities [5]. The forest is an important basis for their rotational agricultural systems. Forest dwellers are most often indigenous population groups that live in and with the forest according to their own traditions, making the forest also an important part of their social and cultural systems [3].

A larger proportion of forest-using people are made up by farmers living at the forest frontiers [2]. Within this group, it is primarily the poor and landless farmers that still rely greatly on forest resources for their livelihoods. Wealthier farmers on the other hand, are less dependent on the forest as their livelihoods are predominantly based on sedentary agriculture. For them, forest products merely function as a supplementary source of income and forest products are gathered or produced (that is, Smallholders) only in times when market demand for certain forest products is high [3]. While the poor forest farmers derive a greater share of their livelihood from forest products, the wealthier forest farmers, with more resources for forest gathering and production, are the heaviest forest users [2]. Commercial forest users do not necessarily live in or near the forest, but do indirectly draw on the forest (part of) their livelihoods through commercial forest activities, such as the production, processing and sale of forest products [5]. Non-timber Forest Products (NTFPs) (for example, game, fruit, firewood, medicinal plants, rattan, bamboo) provide important sources of food, fuel, forage and medicine in rural livelihoods [1]. Most households collect NTFPs for the purpose of household consumption. Some forest products have a permanent place in a household's diet; others only function as a supplement when other food is not available [13]. NTFPs are important 'gap fillers' in rural livelihoods; they help overcome seasonal shortfalls and serve as substitutes during emergencies [1].

The protective function of forest plantation itself cannot be over-emphasized while the participation of forest dwellers in various legal logging activities cannot also be ruled out.

Globally, the area of natural and semi-natural forests is decreasing by about 13 million ha annually. Contrary to this, the average annual rate of forest plantation establishment is 5 million ha. The area of global forest plantations has witnessed a phenomenal growth since the middle of the twentieth century. Global forest plantation area increased from 17.8 million ha in 1980 to 187 million ha in 2000, an increase of about 950%. By 2014, global forest plantation area had risen to 264 million ha and accounts for 7% of total global forest estates. There are indications that the area of forest plantations will continue to increase, making it necessary to assess its potentials to fulfill ecological purposes (e.g., biodiversity conservation) in addition to wood production. While plantations are known for high timber productivity, little is known about their potential to conserve and harbor biodiversity. The question remains whether plantations of economic tree species can harbor biodiversity similar to that in naturally regenerated forests over time.

Thus, a critical issue for future plantation forests is how to create a synergy between management of plantations for production of high-value timber and biodiversity conservation at various spatial scales (i.e., stand, forest, landscape). Managing forest plantations to produce high quality timber while also enhancing ecological services, such as biodiversity conservation involves trade-offs, which can be made only with a clear understanding of the ecological context of plantations in the broader landscape and agreement among stakeholders on the desired balance of goods and ecological services from plantations. Natural resource conflicts are pervasive in Africa, and the West African sub-region is not an exception. Blench^[4] asserts that the rise in natural resource conflicts is as a result of human population increase and the globalization of the economy. According to Blench^[4] resource conflicts can be classified into two, namely point resources including mines, farms and reserves and eco-zonal conflicts including water, grazing and hunting rights^[4]. Conflicts between pastoralists and farmers have been noted as an example of Low Intensity Conflict (LIC) emanating from environmental degradation, resource scarcity, demographic and climate change^[14]. Within the West African sub region, a large section of the population depend on the production of livestock for their livelihood and survival^[14]. According to Shettima and Tar^[14], more than 12 million people in West Africa depend on the production of livestock as their primary means of support whereas over 70 million people in the same region also depend on livestock and livestock related enterprises for their livelihoods. Farmers and pastoralists inter-depend on each other for survival. Pastoralists move their herds to graze on farmlands belonging to crop farmers and also acquire the food stuffs produced by crop farmers. Farmers on the other hand require from pastoralists protein and dairy products^[14]. According to Monod^[8] the survival of pastoralists is dependent upon their interaction with sedentary people. Thus both farmers and pastoralists depend on each other for water, fodder, land and other resources. The relationship existing between farmers and pastoralists therefore makes conflicts inevitable as competing interest arises over the use of natural resources. These conflicts are occasioned by the seasonal weather conditions

which forces pastoralists to move from the semi-arid areas in search of pastures further south, which results in competition over access to available land for crop cultivation and grazing pastures for the cattle^[8].

The Fulani represent one of the most highly populated groups in West Africa, spreading over from the Atlantic Coast to the Red Sea area living in a more or less continuous zone, corresponding mainly to the climatic and vegetational zone of the Sahel^[12]. While the Fulani are indigenous to many states within the Sahelian region, they are also predominantly found in Northern Nigeria, the Futa Toro and Futa Djallon regions of Senegal and Guinea and the Macma regions of Mali and eastwards through Niger and Cameroon^[12]. Although the Fulani are predominantly herders, cattle herding is not the only activity they are engaged in. Some of them are engaged in trading and shop keeping whereas a good number of them have added agricultural activities to their production strategies^[6]. Others have also - adopted farming as their primary mode of subsistence^[6]. The presence of the Fulani in Ghana dates back to colonial times. Although their presence in the Northern sector of the country, then referred to as the Northern Territories of the Gold Coast was a recent phenomenon, they had begun settling permanently by the 20th century even though their number was quite insignificant. According to the Lawra-Tumu District census report, - the population of settled Fulani rose from 100 persons in 1911 to about 302 persons in the 1921 census^[16]. The figure rose to 784 in the 1931 census comprising 400 males and 384 females, an indication that they might have probably moved with their entire families^[16].

Undoubtedly by the 1920s, the Fulani had permanently settled in the Northern territories and by the 1930s, they had become the largest ethnic group not indigenous to the Gold Coast district with more households in the area than other migrant groups such as the Grunshi, Hausa, Wangara, Yoruba and Kilpalsi^[16]. Nevertheless cattle herders and the menace today is no longer a thing that is only heard from far affected people but a seen and witnessed practice in Imo State and within our neighborhood, Hence the need to carry out this research on evaluating the problems encountered by farmers and foresters within the study area, arising from disturbances by cattle rearers.

There have been repeated and bloody clashes between the Fulani herdsmen and host communities for several years. These clashes have claimed thousands of lives within a period of twenty years. In the year 2016 an attack was made in Benue State and Enugu State respectively in which about 340 lives were claimed in the two states and many children orphaned, leaving farmers, local hunters in the communities in the state of confusion. This came to a serious head in Ihie Umuapu in Ohaji Egbema Local Government Area when farmers alleged that herders have been destroying their farms with their cattle, raped women in the area and have attacked and killed some farmers and foresters in the area. This study therefore seeks to evaluate this cattle menace and map out strategies for resolving the issue by carrying out a case study in Ohaji/Egbema Local Government Area of Imo State, South-East Nigeria.

The main objective of this study is to evaluate cattle menace on forest plantations in Ohaji /Egbema Local Government Area of Imo state. *The specific objectives are: to identify the type of plantations adopted by farmers in the study area; to determine perceived effects of cattle menace on these forest plantations in the study area; to identify the strategies for reducing the menace of Fulani nomads and their activities on forest plantations.*

II. THE STUDY AREA

The research was conducted in Ohaji/Egbema Local Government Area of Imo State. The area lies within latitude 5° 12N and longitude 5°48E of the equator. The local government is one of the largest local government areas in Imo State with an estimated population of 800,904 people in 2017 projected from 2006 population figure [10]. The area lies in the forest zone and it is characterized by the growth of tall trees that have luxuriant foliage. The annual rainfall of the area is between 2000-2040mm while the relative mean range of temperature is between 30-35°C, the relative humidity of

the area is between 95% and 100% at dawn and decrease to between 70% and 80% during the maximum temperature [9].

The local government area is bounded by Ngor Okpoala Local Government on the east, on the north east by the River Niger, on the west by Rivers State and on the north by Oguta local government area, The Local Government is made up of 16 communities which include, Egbema, Awarra, Ohuba, Mgbirichi, Urnuapu, Umuokanne, Obosima, Umunwa, Olochi, Mmabu, Obiakpu, Obitti, Urnuagwo, Etekuru, Opuoma, and Arnafor. Its headquarters is Mmahu Egbema. It is characterized by very good climate and highly fertile soil for Agriculture production. The area supports the cultivation of crops and the major occupation of the people is hunting and farming which also involves rearing of livestock. Resourceful trees mainly grown in the area are breadfruit, oil bean, palm tree and bamboo. The crops mostly cultivated in the area include yam, cassava, *relfeiria*, groundnut, maize, water melon, plantain, breadfruit, cashew, walnut and the livestock include goat, sheep and poultry.

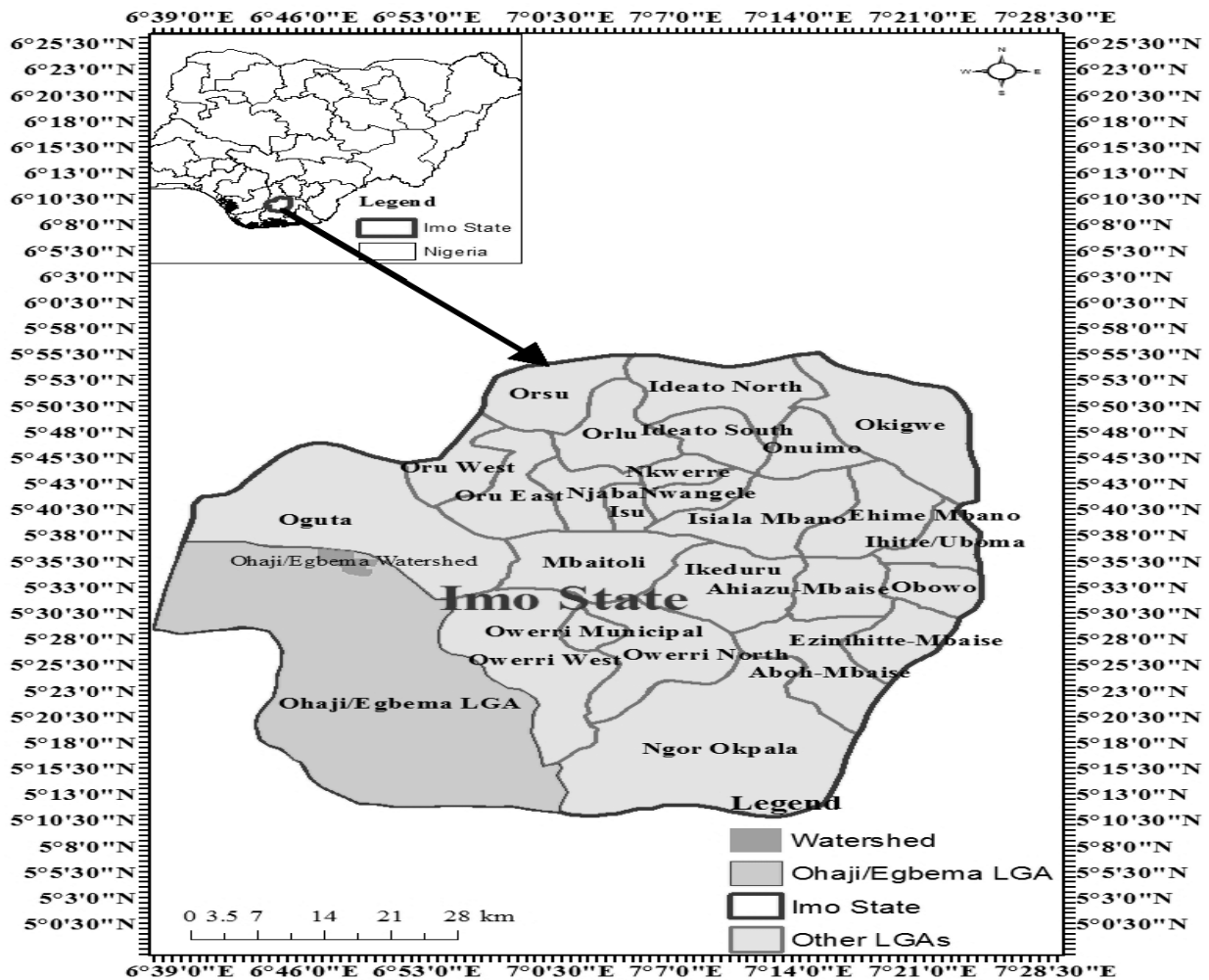


Figure 1: Map of Imo State Showing Ohaji/Egbema LGA
 Source: A.E. Ibe et al (2014) Published in International Journal of Natural and Applied Sciences

III. MATERIALS AND METHOD

3.1. Population of the Study

This involved all the families living around the affected farms/forests in the study area.

3.2. Sampling Procedure/Sampling Method

Simple random sampling technique was used in selecting respondents for the study. Five villages close to the forest/farms were purposely selected. A list of 1200 farmers/foresters was obtained from the village heads in each of the villages. From this list 120 respondents were randomly selected which is the sample size.

3.3 Data Collection

Data collections were gotten through the use of well structured questionnaires. Other relevant information regarding forest plantations within the study area was also observed and recorded. This information helped in designing the questionnaire for the field based interview.

3.4. Data Analysis

Data were analyzed descriptively using mean, frequency tables, percentages. Objective 1 was achieved using percentages. While objectives 2 and 3 were achieved using mean score to be computed on a likert-type rating scale of strongly agree, agree, disagree, strongly disagree assigned weight of 4, 3, 2, and 1. The score was added to give 10 divided by 4 to give 2.50 which is the discriminating index. Any score of 2.50 and above was taken to be a major effect and strategies for handling cattle menace in the study area. While mean score less than 2.50 was not regarded as an effect or strategies for reducing cattle menace effects.

Mathematically,

$$= \frac{4+3+2+1}{4} = 2.5$$

So any effect ≥ 2.5 was taken as the major effects while effects ≤ 2.5 was not regarded as a major effect of cattle menace. Also any strategy ≥ 2.5 was taken as a major strategy for reducing cattle menace while strategies ≤ 2.5 was not regarded as a major strategy in resolving cattle menace problems.

IV. RESULTS AND DISCUSSION

The results of the study are presented in Table I and discussed accordingly. Data obtained from the study were analyzed using descriptive statistics (means, percentages). From Table 1, it was deduced that majority of Ohaji farmers/foresters are majorly males by having 88.3% of respondents over females that have 11.7% of respondents. There was no respondent of the age below 21 and 21-40, but 54.2% of the respondents are within the age of 41-60, 40.8% 61-80 years while 5% are within the age of 81- 100 years. It was observed from the result that majority of the respondents are into full time farming while others have other occupations and still have farming as their part time jobs. The percentage shows that 85.8% of respondents are into farming, 7.5% are traders and 6.7% are civil servants (Table 1). And that 5.8% of respondents are single, 9.2% are widowed, 85% are married,

none of them was divorced, none was separated as well which entails that majority of respondents are married. The result also shows that 27.5% of the respondents had no formal education, 31.7% had secondary education, 8% had adult education, 5% had post secondary and 35% had primary education. This implies that majority of respondents had mainly primary education. And 1.7% of the respondents have 1-3 persons in their house hold, 55.8% of them have 4-6 persons, 31.7% have the range of 7-9 persons, 5% of them have the range of 10-12 persons and 5.8% have 13-15 persons in their house hold (Table 1).

Table 1: Demographic characteristics of respondents

| Variable | Frequency | Percentage (%) |
|-----------------------------------|------------|----------------|
| Sex: | | |
| Male | 106 | 88.3 |
| Female | 14 | 11.7 |
| Total | 120 | 100 |
| Age: | | |
| Below | 0 | 0 |
| 21 – 40 | 0 | 0 |
| 41 – 60 | 65 | 54.2 |
| 61 – 80 | 49 | 40.8 |
| 81 – 100 | 6 | 5 |
| Total | 120 | 100 |
| Mean age = 61 | | |
| Occupation: | | |
| Farming | 103 | 85.8 |
| trading | 9 | 7.5 |
| civil service | 8 | 6.7 |
| Total | 120 | 100 |
| Marital Status: | | |
| Single | 7 | 5.8 |
| Widowed | 11 | 9.2 |
| Married | 102 | 85 |
| Separated | 0 | 0 |
| Divorced | 0 | 0 |
| Total | 120 | 100 |
| Educational qualification: | | |
| No formal education | 33 | 27.5 |
| Secondary education | 38 | 31.7 |
| Adult education | 1 | 0.8 |
| Post secondary education | 6 | 5 |
| Primary education | 42 | 35 |
| Total | 120 | 100 |
| House hold size: | | |
| 1 – 3 | 2 | 1.7 |
| 4 – 6 | 67 | 55.8 |
| 7 – 9 | 38 | 31.7 |
| 10 – 12 | 6 | 5 |
| 13 – 15 | 7 | 5.8 |
| Total | 120 | 100 |

Source: Field Survey, 2018.

In table 2, it is observed that 50% of the respondents certified that palm tree plantation is largely beneficial in the study area. Palm tree plantation is a plantation that is of economic benefit to individuals in the study area. The importance of oil palm in Nigeria economy cannot be over emphasized. Oil palm is a tree crop which has both social and economic value ^[17] ^[20]. In South-East Asia, Wakker ^[20]

reported that oil palm has fed millions, employed over a million and generated billions in dollar income for private sector including producers. 20% of the respondents also certified breadfruit plantation. Apart from being consumed as main dish, the seeds of breadfruit are also used as flavouring in alcoholic drinks

and edible oil can be processed from the seeds [7] [18], 50% certified oil bean plantation, and 30.8% certified bamboo plantation as beneficial in line with UNIDO [19], stated that bamboo tree is a viable replacement for wood as an industrial raw material for traditional and modern sectors and is integrally involved in culture and arts.

Table 2: Description of the type of forest plantations

| Type of Plantation | Frequency | Percentage (%) |
|-------------------------|-----------|----------------|
| Palm tree plantation | 60 | 50 |
| Breadfruit plantation | 24 | 20 |
| Oil bean plantation | 60 | 50 |
| Coconut tree plantation | 0 | 0 |
| Banana plantation | 0 | 0 |
| Bamboo plantation | 37 | 30.8 |
| Plantain plantation | 0 | 0 |

Source: Field Survey, 2018.

Table 3 indicated that majority of the farmers/foresters in the study area uses 4 hectares for their plantations as results

showed that 29.2% of respondents indicated using 4 hectares, 15.8% for 1 hectare, 20% for 3 hectares, 15% for 5 hectares, 5.8% for 7 hectares while none for 10 hectares.

Table 3: Size of hectares of land uses for plantations in the study area

| Size of hectares | Frequency | Percentage (%) |
|------------------|-----------|----------------|
| 1 hectare | 19 | 15.8 |
| 2 hectare | 5 | 4.2 |
| 3 hectare | 24 | 20 |
| 4 hectare | 35 | 29.2 |
| 5 hectare | 18 | 15 |
| 6 hectare | 12 | 10 |
| 7 hectare | 7 | 5.8 |
| 10 hectares | 0 | 0 |

Source: Field Survey, 2018.

Table 4 shows that cattle menace has been on the high side with 92.5% of the respondents agreeing to that, 7.5% of the respondents haven't had any experience of cattle menace in the last ten years.

Table 4. Cattle menace experience

| Cattle menace experience | Frequency | Percentage (%) |
|--------------------------|------------|----------------|
| Yes | 111 | 92.5 |
| No | 9 | 7.5 |
| Total | 120 | 100 |

Source: Field Survey, 2018.

Table 5: Ways of destruction of forest trees/seedlings

| Ways of destruction of the trees/seedlings | SA | A | D | SD | Mean(X) | Remark |
|---|----|----|----|----|---------|--------|
| Chopping off of the leaves | 54 | 66 | 0 | 0 | 3.5 | A |
| Trampling on the tender seedling and young shoots | 52 | 59 | 9 | 0 | 3.4 | A |
| Debranching | 47 | 62 | 6 | 5 | 3.3 | A |
| Chopping off of the growing stems | 55 | 65 | 0 | 0 | 3.5 | A |
| Destruction of the young shoots | 39 | 81 | 0 | 0 | 3.3 | A |
| Destruction of nursery sites | 19 | 37 | 40 | 24 | 2.4 | D |
| Destruction of irrigation facilities | 1 | 1 | 57 | 61 | 1.5 | D |
| Delay in forest seed germination | 8 | 58 | 17 | 37 | 2.3 | D |
| Soil compaction leading to seed dormancy | 30 | 59 | 0 | 31 | 2.7 | A |
| Instant death of forest seedlings | 47 | 38 | 32 | 3 | 3.0 | A |
| Trampling and destruction of food crops | 55 | 54 | 11 | 0 | 3.4 | A |

Source: Field Survey, 2018.

SA = Strongly agreed, A = Agreed, D = Disagreed, SD = Strongly disagreed

Table 5 shows how trees/seedlings are being destroyed by cattle in the study area. The level of destruction was measured using a 4 point likert-type scale of strongly agree, agree, disagree and strongly disagree. A list of possible ways cattle can destroy trees and seedlings was given and respondents were asked to indicate the modes of destruction. The result shows that destructions such as destruction of nursery sites, destruction of irrigation facilities, delay in forest seed germination, were not regarded as the main effects according to their mean scores and their remarks. While destructions such as chopping off of leaves, trampling on the tender seedlings and young trees, debranching, chopping off of the growing stems, destruction of young shoots, soil compaction, instant death of forest seedlings, trampling of the food crops were regarded as the main effects.

Table 6 is showing the number of seedlings damaged which from the table deduced that there was medium level of damage of seedlings, likewise the seeds that was trampled.

Table 6: Seeds and seedlings trampled and damaged

| Number of seedlings damaged | Frequency | Percentage (%) |
|-----------------------------|------------|----------------|
| 1 – 30 | 24 | 20 |
| 31 – 60 | 20 | 16.7 |
| 61 – 90 | 22 | 18.3 |
| 91 – 120 | 11 | 9.2 |
| 121 – 150 | 7 | 5.9 |
| 151 – 180 | 2 | 1.7 |
| 181 – 210 | 22 | 18.3 |
| 211 – 240 | 1 | 0.8 |
| 241 - 270 | 11 | 9.2 |
| Total | 120 | 100 |

| Number of seeds trampled | Frequency | Percentage (%) |
|--------------------------|------------|----------------|
| 1 – 60 | 24 | 20 |
| 61 – 120 | 20 | 16.7 |
| 121 – 240 | 45 | 37.5 |
| 241 – 300 | 5 | 4.2 |
| 301 – 360 | 7 | 5.8 |
| 361 – 420 | 2 | 1.7 |
| 421 – 480 | 7 | 5.8 |
| 481 – 540 | 10 | 8.3 |
| Total | 120 | 100 |

Source: Field Survey, 2018.

Table 7 shows that strategies toward resolving problems of cattle menace in the study area. The strategies were measured with a 4 points likert-type scale of strongly agree, agree, disagree and strongly disagree. A list of the strategies expected to resolved the issue of cattle menace were ‘Compensate land owners, educating farmers and fencing reserves’ were observed to be disagreed with their mean score

of 2.0, 2.0 and 2.0 respectively implying that they are not the major strategies for the resolving of cattle menace while ‘establishing of grazing reserves, demarcation of cattle route, training of foresters, use of resistant varieties’ with the mean scores of 2.7, 3.0, 2.5, 3.0, were agreed as the major strategies for resolving the problem of cattle menace of the study area.

Table 7: Strategies towards resolving problems of cattle menace in the study area

| Strategies | SA | A | D | SD | Mean(X) | Remark |
|---|----|----|----|----|---------|--------|
| Establishing grazing reserves | 50 | 5 | 48 | 17 | 2.7 | A |
| Demarcation of cattle route | 27 | 76 | 2 | 15 | 3.0 | A |
| Compensate land owners | 13 | 20 | 47 | 40 | 2.0 | D |
| Educate farmers | 7 | 21 | 61 | 31 | 2.0 | D |
| Train forest officers | 12 | 47 | 44 | 17 | 2.5 | A |
| Use forest seed that can withstand external forces (i.e. use of resistance varieties) | 48 | 43 | 21 | 8 | 3.0 | A |
| Fencing reserves | 8 | 2 | 43 | 67 | 2.0 | D |

Source: Field Survey, 2018.

SA = Strongly agreed, A = Agreed, D = Disagreed, SD = Strongly disagreed

V. CONCLUSION AND RECOMMENDATION

5.1. Conclusion

The results showed that the major types of plantations adopted by foresters in the study area were beneficial to the farmers. The major effects of cattle menace in the study area are chopping off of the leaves, trampling on the tender seedlings and young shoots, debranching, chopping off of the growing stems, destruction of young shoots, soil compaction, instant death of forest seedlings and destruction of food crops. The results also showed that the different strategies identified for resolving the problems of cattle menace are: establishment of grazing reserves, demarcation of cattle route, training forest officers, use of resistant varieties were strongly believed to resolve the problems.

5.2. Recommendation

Cattle menace has affected most farmers and foresters not only in the study area but in Nigeria as a whole resulting to poor yield of farm and forest resources. It is gratifying and is the candid desire of this work to trigger the zeal and interest not only to speed up work on the reviewed strategies towards resolving the problems of cattle menace, but also for all stakeholders to act fast by putting necessary measures in place to prevent further destructions of agricultural produce and forest resources and to prevent frequent conflicts among farmers and herders and to forestall possible breakdown of law and order that may arise if urgent steps are not taken.

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