

Effect of Wildlife Species on the Activities of Agroforest Farmers in Ekiti State

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Abstract

Continued reduction and fragmentation of natural habitat and feeding site for wildlife species through man's developmental activities, has led to the encroachment of wildlife population into the adjacent farm land to search for food, thereby leading to destruction of agroforestry trees and crops. This study examined the effect of wildlife species on activities of agroforest farmers in Ekiti State forest reserves. The study area was stratified on the basis of vegetation into two zones (rain forest and derived savannah zones). Eighty pre-tested questionnaires were randomly administered to farmers for collection of data. Information obtained revealed that majority of the respondents are married (93%), middle age (50%) men (60 %). Mammals and aves constitutes the highest group of animals present. The respondents opined that wildlife species impact both negatively and positively on their trees and crops.

Some of the damages done by wildlife to trees and crops includes; cutting, uprooting,

trampling, defoliation, browsing of young shoot and leaves and plucking of fruits. Finally the result shows that control measure such as the use of dog, chemical, trapping, scared off by guards, hunting, poison, use of charm and use of human statue, were employed to checkmate the activities of these animals on farmers farmlands.

Key words: Wildlife, agroforestry, farmers, Ekiti-State, forest reserves

1.0 Introduction

In the past, over 14 percent of Nigeria total land mass was made up of forest (FAO, 2004). The forest land cover in the country offers a good habitat for wildlife population and at the same time provide food for them. However, man activities over the years have altered the rich nature of these forest vegetations.

Estimate by NEST (1991) shows that over 50% of these forests and natural vegetation have been cleared for other human developmental project such as road construction, agriculture and urban development (Sayer, 2001). The implication of this trend is continued reduction and fragmentation of natural forest which is the habitat and feeding site for wildlife species. This situation has led to the encroachment by wildlife population into the adjacent farm land to search for food, thereby leading to destruction of trees and crops in agroforestry area (Ayodele and Adegeye, 1993).

The effect of wildlife on agroforest farmers' activities can be extensive. Although damage is most often considered in terms of reduced productivity or delayed harvest cycles, attempts to replace trees after a harvest or a fire out break can also be a complete failure because of foraging wildlife. The full impact of wildlife on agroforest farmers' activities is frequently difficult to assess because of the complexity of the resources interaction. This complexity is inherent because of the spatial and temporal scales of forests. Assessing the effect of wildlife on agroforest farmers' activities is further complicated by the diversity of wildlife species that forage on forest flora, and the varied management approaches employed by landowners. Moreover, wildlife species are considered to be integral and desirable components of forest ecosystems, thus eradicating problem species is not an acceptable option.

Landscapes outside strict protected areas are gaining increasing attention from wildlife researchers for their conservation value. Karanth and Stith (1999) argue that identifying, protecting, maintaining, and monitoring prey-rich habitat patches, with multiple uses, should be central to wildlife conservation and recovery efforts.

Others argue that existing protected areas are already too small to maintain viable populations of many large animals and only by extending the habitat beyond park boundaries can viable wildlife population be maintained over a long period of time (Dinerstein *et. al.*, 1999; Seidensticker *et. al.*, 1999). Historically, the problem of human-wildlife conflict has fallen under the aegis of wildlife conservation authorities. However, their jurisdiction often ends at the park's boundary. Solutions are difficult to develop because there is no other professional discipline which embraces the subject (Sayer, 2001). Ultimately, both people and wildlife suffer the consequences where conflict is unresolved.

As an important land use, the value of agroforestry systems for integrating biological conservation (plant and animal) and economic development goals is high. Agroforestry plays an increasingly important role in the protection and conservation of wildlife population and the overall maintenance of stable ecosystem. It is believed that these values can be increased still further if the agroforest farmers in the rural community decide to assume a leadership role in addressing the issue of human-wildlife conflict, which is fast becoming a central threat to the effectiveness of the system and survival of many large endangered species.

Farmers, foresters and wildlife conservators can benefit enormously if appropriate methods are developed to vigorously define the distribution and frequency of conflict between the wildlife population and agroforest farmers in the forest reserves and other protected areas. Therefore, the aim of this study is to assess the effect of wildlife population on the activities of agroforest farmers in Ekiti-State forest reserves and suggest were necessary ways of more collaboration among the stakeholders.

2.0 Methodology

2.1 Study area

The study was carried out in Ekiti-State, Nigeria. Ekiti-State is located between Longitude $4^{\circ} 5^1$ and $5^{\circ} 4.5^1$ East of the Greenwich meridian and Latitudes $7^{\circ} 15^1$ and $8^{\circ} 5^1$ North of the Equator in Southwestern Nigeria. The climate of the study area is of the West Africa monsoonal type with dry and wet season; the dry season normally start from November through March and is characterized by dry cold wind of harmatta. The rainy season normally start from late March through October with occasional strong wind and thunder storm, usually at the onset and the end of the season.

The annual rainfall ranged from 750 mm in the northern zone to 1200 mm in the southern zone. Temperature ranges between 21°C to 34°C with little variation throughout the year. Annual average relative humidity is about 90 % at 7.00am and 65 % at 4.00pm. The topography is hilly with large numbers of hills of various sizes surrounding most of the towns and villages. Ekiti-State covers an area of $6,353\text{km}^2$.

Two distinct types of vegetation are predominant in the study area namely; the derived savannah vegetation to the northern peripheries and the rain forest belt covering larger percentage of the total land area to the south.

2.2 Sampling procedure

The study area was stratified into two zones on the basis of vegetation (derived savannah and rainforest). One forest reserve was purposively selected from each of the vegetation zones based on the preliminary study which shows the preponderance of agroforestry activities in those forest reserves. Four villages surrounding each of the forest reserve were selected. Ten randomly selected agroforest farmers in each village were interviewed using personal contact method guided by a pre-tested interview schedule, since few of the respondents cannot read or write. The interview schedule which contains both structured and unstructured questions was designed to obtain information on the respondents' socio-economic characteristics, wild animal species present, damage caused to agroforest farmers' trees and crops and control measure put in place to checkmate the wildlife species. Data collected from the study was analyzed using descriptive statistical in form of frequency and percentages.

Table 1: Distribution of Respondents in the Study Area

Vegetation belts	Forest reserves	Village	No of respondents
Rainforest	Ise	Kojola-Ise	10
		Orun-Ekiti	10
		Ilupeju-Ijan	10
		Obada-Ise	10
Derived Savannah	Eda	Eda-Ile Ekiti	10
		Omuo-Ekiti	10
		Ilasha-Ekiti	10
		Ayebode-Ekiti	10
Total	2	8	80

3.0 Results and Discussion

3.1 Socio-economic characteristics of respondents in the study area

Results on Table 2 shows that majority of the respondents are fairly old (>30 years) married (93%), men (77.5%), which revealed that farming activities in the study area was practically in the hand of aged men. This finding agreed with earlier report by Olujobi, (2012) who noted that the culture of the people in the study area place the responsibility of provision of the family needs on men. The result also revealed that 77.5% of the respondents' family size is above 4-6 members.

This is an indication that the respondents had enough hands to assist them on their farm, as most of the operations (clearing, weeding and tending) in agroforestry are labour intensive. Result on educational background shows that only 18.75% of the respondents do not have formal education. This revealed a high literacy level among the respondents in the study area, thus dissemination of information to farmers either through print media or radio program on modern and improved agroforestry practices by forest officers was not a problem. This assertion agrees with that of Ajayi *et al.*, (2011).

Table 2: Demographic information on the respondents

Variables	Frequency(n=80)	Percentage
Sex		
Male	62	77.5
Female	18	22.5
Age		
< 30Years	10	12
31-50Years	40	50
>50Years	30	38
Marital status		
Married	74	93
Single	6	7
Family size		
1-3	18	22.5
4-6	42	52.5
>7	20	25
Educational background		
Non-Formal	15	18.75
Primary	42	52.5
Secondary	12	15
Post-secondary	11	13.75

3.2 Wildlife population and interaction with agroforestry crops

Result on Table 3 shows that respondents in the study area was of the opinion that mammals (27.78%) and aves (26.04%) form the most common group of animals found on their farms.

The observed long list of wildlife species identified in the study area (Table 5) is an indication that forest reserves in Ekiti state is still very rich in wildlife population.

This statement was supported further by Ayodele and Adegeye (1993) who reported the preponderance of wild animals such as primates, buffalos, birds, squirrels, grass cutters, giant rats and other rodents in the rain forest zone of Nigeria. Table 4 shows the interaction between wildlife population and trees in the study area.

The result revealed that all the respondents in the study area were of the opinion that there were interaction between wildlife present and agroforestry trees and crops.

This interaction often leads to raiding and destruction of most of the trees and crops in the agroforestry plots, thereby resulting into conflict between wildlife conservator and agroforest farmers in the forest reserves. This assertion confirms the submission by AWF, (2005) that conflict between wildlife conservator and the local communities today is a serious threat to conservation in Africa.

Table 3: Distribution of Respondents on the Groups of Wildlife Present

Groups of wildlife	*Frequency	Percentage (%)
Mammals	80	27.78
Reptiles	65	22.57
Aves	75	26.04
Insect	68	23.61
Total	288	100

*Multiple responses

Table 4: Distribution of Respondents on the Interaction

Interaction	Frequency	Percentage (%)
Yes	80	100
No	0	0
Total	80	100

3.3 Effect of wildlife population on agroforestry trees and crops

Table 5 presents the type of damage cause and benefits enjoyed by the wildlife present in the study area. Observation from the study have also shown that wildlife species greatly affect the activities of the respondents either positively or negatively. Some of the negative impact of wildlife population on the activities of the respondents cut across both the agricultural crops and the tree crops. Some of the damages done to these crops as observed in this study includes among others; cutting, uprooting, trampling, defoliation, browsing of young shoot and leaves and plucking of fruits (Table 5).

This observation further confirms the earlier report by Ayodele (1988) that young succulent seedlings and nurseries as well as plantations suffer heavily through trampling in Old Oyo National Park. Similarly, Fatoba (1991) reported the damage done to forest plantation by buffalo and warthog in Ondo State of Nigeria.

Apart from the influence of the higher animals on respondents farming activities, result from this study have also shown that some groups of lower animals most especially crickets and other insects cause great harvoc to trees and crops through defoliation and transmission of diseases.

This assertion corroborates the reports of Adegeye (1990), Odeyinde (1980), Akachukwu and Amakiri (1992) that some insect attack leaf,stem and fruits of *Gmelina arborea*, *Tectona grandis* and Eucalyptus in various plantations in South West Nigeria.Results from this study has shown that many of the wildlife species that cause damage to trees and crops are equally beneficial to the people in the rural communities in the study area.It is obvious that specific part of some of the animals are used for different purposes(Table 5).

The result equally revealed that greater proportion of the wildlife species such as Cane rat, Bush pig, Squirrel, Warthog, Forest hog, Dicker, and Ground squirrel to mention but a few are consumed as meat.

This observation is in consonance with Lameed *etal* (2005) and Ogunyemi (2005) that people in the rural communities around forest estates have preference for bush meat than domestic animal meat. Also specific part of some species such as Pangolin, Monkey, Dickers, Hedge hog and Birds are used for medicinal purposes (Table 24).

This observation agrees with Afolayan (1987), Lameed and Edet (2002) and Lameed *et.al* (2005) that many wildlife species are used to make ingredients in traditional healing and preventive medicine and also for invoking and appeasing traditional deities.

Table 5: Distribution of Respondent on Species of Wildlife, Benefits and Damage Caused.

Species	Type of damage	Crop attack	Benefits
Cane rat	Cutting,,Destructionof tuber,Uprooting of Seedlings	Maize, Oil Palm, Rice, Cassava,	Meat, Income
Bush Pig	Trampling, Uprooting	Yam,Cassava, Cocoyam, Young seedlings	Meats, Income
Insects	Defoliation, Destruction of seeds	Gmelina seedlings, Young oil palm seedlings	Larva serves as delicacy,aerate the soil
Grasscutter	Cutting, Uprooting, Destruction of tuber.	Rice, Maize, Sugar cane, Oil Palm, Cassava	Meat, Income
Monkey	Plucking of Fruits, Trampling and Browsing growing tip	Cocoa, Oranges, Banana	Skin for leather, Meat, Income
Grasshopper	Defoliation	Cassava leaf & Stem, other crops	Pollination of Flowers, Delicacy.
Bees	Stinging	-	Pollination of Flower, Honey.
Pangolin	Digging, uprooting of young seedlings	Young Agroforestry seedlings	Meat, Medicinal
Cricket	Defoliation	Cassava leafs and stem, other crops	Meat
Squirrel	Cutting and Uprooting	Yam, Cocoyam, Oil palm	Meat
African Black Kite	Destruction of Grain at millk stage	Rice, Maize, Other grains	Meat
Ground Squirrel	Trampling, Cutting, Digging, Uprooting of Seedlings	Cassava, Yam, Sugarcane	Meat
Wart Hog	Trampling, Destruction of heaps and seedlings	Yam, Cassava	Meat
Bush Baby	Trampling and destruction of young seedlings, browsing	Rice, Maize and other grains, young seedlings of yam	Meat
Forest Hog	Destruction of heaps and ridges, damage of young seedlings	Young seedlings of economic trees such as Teak, Gmelina	Meat
Water Buck	Trampling and destruction of young seedlings	Young seedlings of economic trees such as Teak, Gmelina	Meat
Cattle Egret	Digging out seed and seedlings	Grains and young seedlings	Medicinal
Duicker	Trampling, destruction of heaps and Ridges, browsing the young leaves at growing tip	Young seedlings of economic trees such as Teak, Gmelina and crops like Yam, Cassava	Meat,Income, Medicinal
Quail	Digging out seed and seedlings	Grains and young seedlings	Meat
Banana Bat	Destruction to banana	Banana	Meat
<i>Anaphevenata</i>	Defoliation	<i>Triplochitonspp, Terminalia spp, Gmelina arborea</i>	Larva are used as delicacy
Quele Bird	Sucking of rice fruit at the milk Stage	Rice, maize cub and other grain	Meat, Medicinal
Franquets' Bat	Destroy grains	Maize, rice	Meat, Medicinal
Hedge Hog	Destruction of young seedlings and growing shoot of some crops	Kolanut seed, Shoots of Cocoyam, Succulent part of seedlings	Meat, Medicinal
Rodent	Destruction of roots and shoot	Grains, Tubers and seedlings of trees	Meat

3.4 Control measures employed to checkmate activities of wildlife in the study area

As indicated in the result on Table 6, the study revealed that some of the animals attack agroforestry crops exclusively either in the day time or at night, while some do carried out their destructive activities during both day and night. This situation has made the control of these animals to be difficult for the farmers, and to worsen the situation the more, their destructive activities are perpetrated throughout the year (Table 6). Also restriction order by government that prevent indiscriminate killing of animal in the reserved area has made it more difficult for the farmers to control the animals on their farms (especially the endangered species).

However considering the extent of damage and havoc done by the various wildlife species to agroforestry trees and crops in the study area, respondents have devised various means of checkmating these animals on their farms. Observation from the study revealed that some of the control measures employed by farmers include the following: use of dog, chemical, trapping, scared off by guards, hunting, poison, use of charm and use of human statue. This observation is similar to that of Ojo and Akinyemi (2005) at the villages around the Yankari National Park in Nigeria.

Table 6: Time of the Day and Season of the Year Wildlife Species Cause Damage.

Species	Time of the day	Season of year	Control measure
Cane Rat	Night	All season	Hunting, with gun, trapping, poison, use of dogs.
Bush Pig	Night	All season	Hunting with gun, trapping
Insects	Day and night	All season	Chemical
Grass-cutter	Day and night	All season	Hunting with gun, trapping, and use of dogs.
Monkey	Day and night	All season	Hunting with gun, scared off by guards.
Grasshopper	Day	Dry season	Chemicals
Bees	Day and night	All season	Chemicals
Pangolin	Night	All season	Hunting with gun, scared off by guards, use of dog
Cricket	Day and night	Dry season	Chemicals
Squirrel	Day and night	All season	Trapping, use of dogs.
African Black Kite	Day	All season	Hunting with gun, scared off by guards, use of charm.
Ground Squirrel	Day	All season	Trapping, use of dogs., use of human statue
Wart Hog	Day and night	All season	Hunting with gun, scared off by guards.
Bush Baby	Day and night	Dry season	Hunting with gun, scared off by guards.
Forest Hog	Night	Dry season	Hunting using dart gun, scared off by guards.
Water Buck	Night	All season	Hunting with gun, scared off by guards.
Cattle Egret	Day	Dry season	Scared off by guards. catapult
Duicker	Day and Night	All season	Hunting with gun, scared off by guards.
Franquets' Bat	Night	All season	Scared off by guards, use of charm.
Quail	Day	All season	Poison, trapping, catapult, use of human statue
Banana Bat	Night	All season	Scared off by guards.
<i>Anaphevenata</i>	Day and Night	Wet season	Chemicals.
Quele Bird	Day	All season	Hunting with gun, use of human statue, scared off by guards, use of charm.
Hedge Hog	Night	All season	Hunting with gun, trapping.
Rodents	Day and Night	All season	Trapping, use of dogs, poison, catapult.

Conclusion

With the intensified land use for crop production in reserved area, increased control of wildlife is inevitable. Since wildlife is a renewable resource that has legitimate claim in the land use as agroforestry trees and crops, therefore, to solve the problem of wildlife encroachment on farmers' farm land, government should as a matter of urgency make provision for wildlife management in land use plan for afforestation at the planning stage. Also there should be an integration and collaboration between the principal actors (foresters, agriculturists and wildlife conservators) to fashion out agroforestry technology that would encourage both animals and farmers to use the same land without much conflict. Furthermore agroforest farmers should be educated on modern ways of controlling wildlife problem on their farm without necessarily killing them.

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