
**ASSESSMENT OF WILDLIFE PESTS ON FADAMA FARMS ALONG RIVER BENUE
(FROM ABINSI TO AGBOUGHUL SETTLEMENTS) IN MAKURDI LOCAL
GOVERNMENT AREA OF BENUE STATE, NIGERIA**

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ABSTRACT

This study explored the effect of wildlife pests on the large expanse of fadama land from Abinsi to Agboughul Settlements in Makurdi Local Government Area of Benue State, Nigeria. Structural questionnaire such as focus group discussion (FGD) targeting young energetic farmers between the ages of 21-30 years was used. Random sampling technique was employed to select one hundred respondents from the two settlements, (50 each from the two settlements). The data obtained were subjected to descriptive statistics (such as frequency, percentages and tables). The result showed that cane rat (*Thryonomys swinderianus*) (37%) and rabbit (*Capensis cuniculus*) (32%) caused the most damage to the Fadama crops as compared to giant snails, (*Achatina achatina*) (11%) and Nile rat (*Arvicanthis niloticus*) (20%). Furthermore, 44% of the farmers agreed that the animals visited the farms at night and while 25% and 11% believed the visits were in both night and early morning respectively. Attempt to control the wildlife pests revealed that most species continually killed could be as a result of lack of awareness campaign, agro forestry practices and integrated farming system. These endangered species or at least threatened may pose a dangerous trend to our wildlife conservation principles. However, this can be minimized through well planned education programmes for the farmers.

Keywords: Fadama, Wildlife, Pest, floodplain, Season.

1. INTRODUCTION

Fadama farming is practiced along major floodable plains and Savannah Rivers mainly to increase the farmers' self sufficiency in food production and income. Increase in food production is achievable through increased agricultural activities in both wet and dry seasons, (Junk et al, 1989). The National Fadama development was structured into developmental stages for efficiency in implementation strategy, (Obieching, 2000). The project design is both participatory and socially in nature.

The approach is to empower farmers to take control of/ and manage their resources for their own development, (Aderinola, 2001). The programme is expected to reduce the poverty level of small holder farmers through increased agricultural production and the attendant income, (Ogunlela, 2008). The major financiers are the World Bank (WB), African Development Bank (ADB) and Nigerian Government, (NFDO, 2005). Fadama farmers in Benue State, Nigeria utilize the large expanse of Fadama lands in these areas for both crop production and grazing. Other activities

include fishing/fish farming and a forestation programmes, (NFDO, 2007).

However, there are numerous challenges militating against the optimum derivable benefits that the Fadama has to provide to stakeholders. The most important of these challenges is that of Wildlife pests raids, apart from insects, diseases and weed management in crop lands. Intensification of agricultural activities has often brought with it pest related problems.

For example, harmful chemicals threaten the environment and human health alike (Cooper and Dobson, 2007).

Therefore, integrated pest management (IPM) has emerged as a way towards maintaining or increasing agricultural productivity without over-reliance on synthetic chemical pesticides. One of the fundamental principles of IPM emphasizes the need not only to deal with pests and diseases once they have become a problem but also to promote the growth of healthy crops or livestock in trying to conserving the natural resources base, (Nathaniels et al, 2003). However, well detailed informations about farmers' awareness of wildlife pests and diseases are necessary in fashioning programmes that would aid the realization of the objectives of the Fadama programmes.

2.MATERIALS AND METHODS

Study Area: This study was carried out and concluded on Fadama farms along the River Benue in Abinsi and Agboughul settlements in Makurdi Local Government Area of Benue State, Nigeria between March 2014 and April 2015. Makurdi (study Areas) lies between latitude $7^{\circ}44^1$ to $8^{\circ}.22^0N$ and longitude $8^{\circ}.32^1E$ and $8^{\circ}.44^1E$ with an altitude of 112m above sea-level.

Vegetation and Climate:

This area lies within Guinea Savannah vegetation, characterized by two clear distinct wet and dry seasons. Rainy seasons begins from April to October, averaging 1524mm/annum and temperature ranging between $28^{\circ}C$ - $30^{\circ}C$ most times of the year. Dry season begins from November to early April with dry harmattan wind and temperature ranging from $20^{\circ}C$ to $35^{\circ}C$.

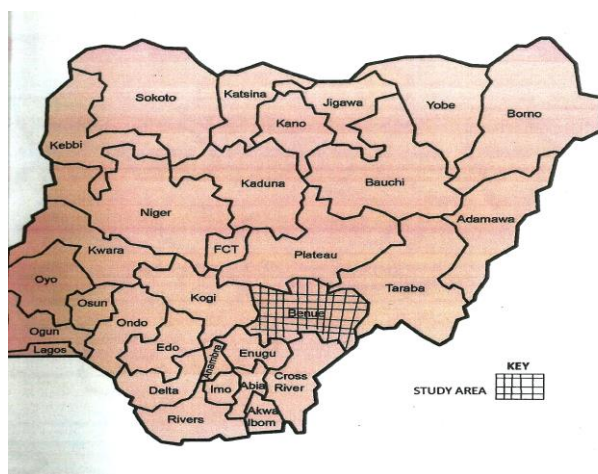
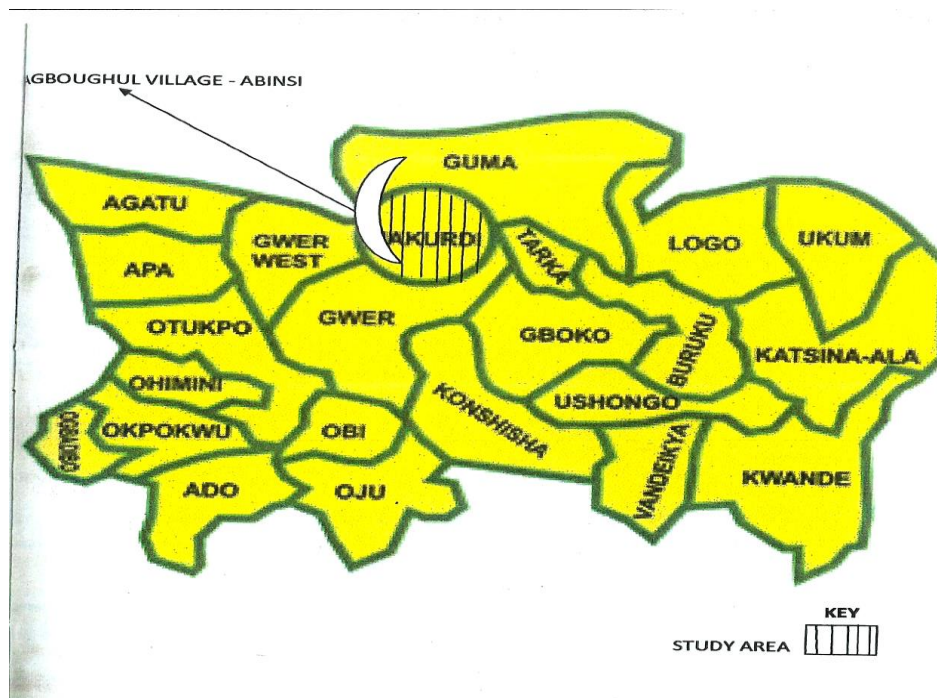


Fig1&2: Maps of Nigeria/Benue state/study Area(Abinsi to Agboughoul settlements).



Farming Activities/Far

Farmers Activities/Farm Products:

The farmers were predominantly Hausa, Tiv, Kabawa and Jukum people living along the bank of the River Benue (Abinsi and Agboughul areas). The agricultural products include the **followings: cassava, Guinea corn, rice, sugar cane, vegetable, garden eggs, green leafy vegetables (Ugwu leaf), groundnut, potatoes, tobacco and maize.** During dry season, irrigation is predominantly practiced. Wild animals species found in the area as pests include giant rat (*Cricetomys gambianus*); cane rat (*Thryonomys swinderianus*); Squirrel (*Xerus erythropus*); Nile rat (*Arvicanthus nilotecus*), weaver birds (*Ploceus cucullatus cucullatus*) and reptiles such as giant tortoise (*Kinxys crosa*).

Farm Size:

Most of the farm size in both study areas were between 1-2 hectares per farmer along the bank of River Benue.

Farmers Age Group:

From the data collection, the farmers age were between 18-20 years (school age); young farming age (between 21-30 years) and strong elderly between the age of(41-51 years).

Methodology:

Structural Questionnaire (Focus Group Discussion) was designed for the farmers. One hundred

questionnaires were administered on one hundred respondents (50 each from Abinsi and Agboughul). Frequent visits (three times per week) were also made to farms where wildlife pests could be sighted physically with the kind of damage to crops and parts of crop affected during the farming/harvesting seasons. Subsequently, animal burrows, feeding sites and affected crop types were examined. The information collected from the farmers include, wildlife species causing damage, the time of visit of the animal to the farm, parts of the crops/plants damaged, the period of the year these animals caused most damaged, the level of damage, the residence of the animal and methods of control. These informations were then tabulated and percentage frequency obtained.

Data collection

Primary data were obtained from structural questionnaire (Focus Group Discussion) administered to 100 farming Respondents from the two villages (i.e. 50 each from Abinsi and Agboughul). Secondary data were also obtained from oral interviews and unpublished materials.

Data Analysis

The data were analyzed using descriptive statistic such as frequency, percentages and tables.

3. RESULTS

Table 1: Wildlife pests that caused damage to crops at Agboughul and Abinsi

S/N	Common Names	Scientific Name	Agboughul	Abinsi
1.	Rabbit		+	-
2.	Cane rat		+	+
3.	Giant tortoise		-	+
4.	Nile rat		+	+
5.	Squirrel		+	+
6.	Giant rat		+	+
7.	Grasshopper		+	+
8.	Cricket		+	+
9.	Termites		+	+
10.	Birds		+	+

Source: Field Survey (2014/2015)

(+) = Present

(-) = Absent

Most wildlife pests were found in both study areas except that Giant tortoise was not seen in Agboughul while rabbit was absent at Abinsi farms.

Table 2: Different crops and pest infestation in Agboughul + Abinsi

S/NO	Name of Crop Common Name	Specific types of wildlife pest infestation common Name	Scientific Name
1.	Sugar cane	Cane rat	
2.	Rice	Birds/Grasshopper	
3.	Maize	Birds/Squirrel	

4.	Cassava	Nile rat
5.	Vegetables	Cricket
6.	Potatoes	Termites/Cane rat
7.	Tobacco	Bug
8.	Groundnut	Squirrel/Rat
9.	Guinea corn	Birds/rat
10.	Yam tuber	Nile rat

Source: Field Survey (2014/2015)

Table 2 showed the specific types of wildlife pest infestation in both Abinsi and Agboughul settlement in Makurdi Local Government Area of Benue State, Nigeria.



Plate 1: Stalks of sugar damaged by wild animal pests
Sources: field survey (2014).



Plate 2: Tools used in killing wild animal pests
Sources: Field survey (2014).

Table 3: Demographic/social-economic status of the respondent

OPTIONS		BOTH		ABINSI			
		AGBOUGHUL					
		Frq	%	Frq	%	Frq	%
Sex	Male	66	34	11	78	27	54
	Female	34	66	39	22	23	46
	Total	100	100	50	100	50	100
Marital Status	Single	45	45	21	42	24	48
	Married		41	41	19	38	22
	44						
	Divorced		8	8	6	12	2
	4						
	Widow	4	4		3	6	1
2	Seperated		2	2	1	2	1
	Total	100	100	50	100	50	100
	Religion	Christianity		57	57	9	18
96	Muslim		19	19	17	34	2

Age	40	Traditional	19	19	19	38	0
	20	Others	5	5	5	10	0
		Total	100	100	50	100	50
		<20	24	24	8	16	16
		21 – 30	46	46	26	52	20
	40	31 – 40	23	23	12	24	11
	22	41 – 50	4	4	3	6	1
	2	>50	3	3	1	2	2
		Total	100	100	50	100	50
Educ. Status	20	Non-formal education	20	20	10	20	10
	12	Primary	7	7	1	20	6
	38	Secondary	37	37	18	36	19
	14	ND/NCE	13	13	6	12	7
		HND/Degree	13	13	5	10	8
		PGD	10	10	10	20	0
		Total	100	100	50	100	50
Family Size	16	0 – 3	15	15	7	14	8
		4 – 6	31	31	8	16	23
		7 – 9	39	39	27	54	12
		10 – 12	12	12	6	12	6
	12	12 above	3	3	0	0	1
	2	Total	100	100	50	100	50
Occupation	8	Civil Servant	10	10	4	8	6
	6	Fishing	21	21	17	34	4
	2	Trading	12	12	9	18	3
		Tailoring	3	3	2	4	1
		Othera	6	6	0	0	6
		Total	100	100	50	100	50
Annual Income		<2000	32	32	12	12	20

20	21000 – 40000	4	4	4	4	0
0	41000 – 60000	18	18	11	11	7
7	61000 – 80000	12	12	08	8	4
4	81000 – 100000	9	9	4	4	5
5	>100000	25	25	11	11	14
14	Total	100	100	50	100	50

Source: Field survey,(2014)

From table 3, 66% of the respondents were males while 34% were females. Furthermore, 45% were single, (41%) married, 8% divorced, (4%) widows and (2%) separated. Also, (57%) were Christians, (19%) Muslims and traditional worshippers others, (5%). However, 46% of the farming population were between 21-40 years of age, while 24% were less than 21 years of age which were the most active age for farming. Educationally, 37% had secondary school education, 13% were ND/NCE holders while 20% had no formal education and only 7% attended primary school. Also, 39% of the farmers had household size of 7 to two persons; 31% had 4-6 persons while 30% had household size between 0-4 persons. From the table also, the major occupation of the farmers was crop farming (48%) while 21% went into fishing. Traders and Civil servant had 2% and 10% respectively. In income generation, 32% had an annual income less than #20, 000 while 25% had an annual income of above #100, 000.

Table 4: Activities of pests and level of Destruction

	OPTIONS		BOTH		ABINSI	
	AGBOUGHUL		Frq	%	Frq	%
Other works apart from farming		Civil Servant	23	23	18	36
5	10					
30		Student	31	31	16	32
40		Trading	23	23	3	6
14		Tailoring	18	18	11	22
		Others	5	5	2	4
					3	6

	Total	100	100	50	100	50	100
Animal cause damage to crops	No			29	29	23	46
6	12						
	Yes	71	71	27	54	44	88
	Total	100	100	50	100	50	100
Wild Animals causing most Damage	Cane Rat				20	20	8
16	12	24					
	Rabbit	53	53	33	66	20	40
	Giant Snail		9	9	7	14	2
4							
	Nile Rat		16	16	2	4	14
28							
	Others	2	2	0	0	2	4
	Total	100	100	50	100	50	100
Animal causing most damage	Cane Rat				37	37	12
24	25	50					
	Rabbit	32	32	18	36	14	28
	Giant Snail		20	20	11	22	9
18							
	Nile Rat		11	11	9	18	2
4							
	Total	100	100	50	100	50	100
Time of visit to animals	Early Morning			16	16	8	16
8	16						
	Night	44	44	15	30	29	58
	Day-light		25	25	12	24	13
26							
	Others	15	15	15	30	0	0
	Total	100	100	50	100	50	100

Part of crops damage 16 32	Leaves			1	1	1	2
	Stem	39	39	23	46	19	38
	Seed	32	32	13	26	11	22
	Bark	24	24	13	26	4	8
	Others	4	4	0	0	0	0
	Total	100	100	50	100	50	100
Type of crop destroyed 8 16 6 26	Sugarcane			32	32	17	34
	Rice	31	31	28	56	15	30
	Vegetable		3	3	3	6	3
	Maize	10	10	2	4	11	22
	Cassava		11	11	0	0	13
	Others	13	13	0	0	0	0
	Total	100	100	50	100	50	100
Period of the year damage is most 38	Rainy		39	39	22	44	19
	Dry	24	24	11	22	13	26
	All yr	37	37	17	34	18	36
	Total	100	100	50	100	50	100
Level of damage 56	Heavy		38	38	10	20	28
	Light	46	46	26	52	20	40
	Others	16	16	14	28	2	4
	Total	100	100	50	100	50	100
Animals most abundant 3 6 40 22	Cane Rat			32	32	29	58
	Nile Rat		29	29	9	18	20
	Giant Snail		14	14	3	6	11

	Rabbit	14	14	3	6	11	22
	Cricket	11	11	0	0	11	22
	Total	100	100	50	100	50	100
Residence of animals 13 26	Inside the farm			30	30	17	34
	Around the farm		40	40	17	34	23
	Away from the farm		30	30	16	32	14
	Total	100	100	50	100	50	100
Stage of Attack 13 26	After flowering			22	22	9	18
	After maturity	24	24	9	18	15	60
	At any stage	50	50	29	58	21	42
	Others	4	4	3	6	1	2
	Total	100	100	50	100	50	100

Source: Field Survey, 2014

From table 4, Cane rat (*Thryonomys swinderianus*) 20% and Nile rat (*Arvicanthus niloticus*) 16% caused the most damage. While giant snail caused the least damaged. About 44% of the farmers agreed that animal visited the farms at night while 41% believed the visits were in the night and early morning.

However, 15% of the farmers were of the opinion that the wild animals visited the farms any time of the day. Also, from table 4, 39% of the wild animal pest attacked stem while 32% destroyed the seeds; 24% destroyed the bark and 5% destroyed leaves and other parts. Most damage (39%) was done during rainy season while 24% were mostly during dry season. However, 37% believed the damaged was all throughout the year. The result also revealed that 46% opined the damage was light while 38% indicated heavy damage. However, 16% could not really ascertain the level of the damage. From the table 4 also, the most abundant wildlife pests in the study areas was cane rat (32%) while the least was cricket (11%). The result also showed that 40% of the animals lived around the farm while 30% were believed to have lived inside and away from the farm respectively. Moreover, 50% of the farmers believed the attacked was at any stage while 24% and 22% concluded that the attacks were after matured and flowering plants respectively.

Table 5: Control methods used for pests

	OPTIONS AGBOUGHUL		BOTH		ABINSI			
			Frq	%	Frq	%	Frq	%
Control method	Chemical		44	44	16	32	28	56
	Biological	22	22	11	22	11	22	
	Integrated Farming	20	20	14	28	6	12	
	Physical		13	13	8	16	5	10
	Others		1	1	1	2	0	0
	Total	100	100	50	100	50	100	
Use of Poisonous baits	Yes		22	22	11	22	11	22
	No		78	78	39	78	39	78
	Total		100	100	50	100	50	100
Awareness of Organizational concerned	Yes		27	27	15	30	12	24
	No		73	73	35	70	38	76
	Total		100	100	50	100	50	100
With protection of wild life	Total		100	100	50	100	50	100
Tools used in killing wild life	Dane Gun		4	4	1	2	3	6
	Bush burning		15	15	11	22	4	8
	Traps		48	48	21	42	27	54
	Chemicals	31	31	15	30	16	32	
	Others	2	2	2	4	0	0	
	Total	100	100	50	100	50	100	
Estimated crops destroyed	50 Mt/Ha/Yr		40	40	22	44	18	36
	50 – 100Mt/Ha/Yr		3	3	19	38	11	22
	>100m Mt/Ha/Yr		30	30	9	18	21	42
	Total		100	100	50	100	50	100

Source: Field Survey, (2014)

Table 5 showed the various method used by farmers in the study area to control pests. These were chemicals (44%), biological method (20%), while 20% uses integrated farming method, 13% and 1% uses physical and other method of controlling pests respectively.

In this table also, 22% of the farmers use poisonous bait to control pest while 78% do not use poisonous bait to control in the study area.

The result further showed that 27% of the FADAMA farmer were actually aware of the organization involved in the protection of wildlife pests protection.

Furthermore the farmers used traps (48%), Chemical (31%), and 15% used bush burning as a method in pest control. The result in the table showed the estimated crops destroyed 50Mt/Ha/Yr (40%), while 30% believed it was far above 100m Mt/Ha/Yr.

4. DISCUSSION

The effect of wildlife pests on FADAMA farms in Abinsi and Agboughul villages along River Benue in Makurdi Local Government Area was investigated. The survey was carried out during the dry season (November (2014)- April, 2015) during dry season farming activities in the Fadama areas. The quantity of crop/plants damaged was not accurately known since the farmers were not keeping the authentic records. However, the damage caused by the pests may represent a significant loss to the farmers who could only afford to cultivate small hectares (average of 1-2 hectares) of the farm land annually. Most of these wildlife pests are visible during dry burning period of late December to January. This was in line with the view of Ayodele and Akanbi (1993), during their work on effect of ecological study of wildlife pests on Fadama farms in Savannah zones of the middle belt of Nigeria.

From the 100 questionnaire administered on Fadama farmers and 20 farms visited showed that four major wildlife pests were identified with cane rats (*Thryonomys swinderianus*) as the most abundant representing 32% of the pest population. The abundance of cane rat may be due to high birth rate (litter size) as a result of abundance food in the study areas, (Odoh, 1993). However, the numbers of crops and plant damaged in Agboughul Fadama farms were less than that of Abinsi. This might be as a result of the proximity of Agboughul to Makurdi main town being a sub-urban community with major cosmopolitan disturbing influences from Makurdi town.

According to the Fadama farmers majority of the wildlife pests (44%) were essentially nocturnal, apparently as an adaptation to avoid predators. But other species, notably the Nile rat, *Arvicanthus niloticus* were more active both day and night.

It was also revealed that the stem, seed and bark were the parts of crops/plants mostly damaged by the wildlife pests e.g. sugar cane, rice and cassava. About 40% of the respondent indicated the presence of these wildlife pests in the farms.

Probably, this is because suitable habitats such as shrub and grasslands, warehouses and domestic premises served as home and harbor these wildlife pests, (Funmilayo, 2008). The pest control measures adopted by farmers, though not very effective included traps (48%), chemicals (31%), bush burning (15%), use of dane gun (4%) and biological method such as the use of hunting dogs (22%). It is wise to mention here too that these methods were inimical to wildlife conservation principles.

Usually, wildlife legislations forbid the capture of pregnant females, infant and nursing parent stock in order to enhance procreation and perpetuation of the stock species, (Palmer and Martin, 1999). Also, the poison baits used in hunting/killing these wildlife fauna pests, endangered the life of the final consumers of the 'bush meat' and the farm products, (Bamgbose et al, 1996).

5. CONCLUSION

This study indicates that wild animal pests caused damage to crops even on Fadama farms. This brings about economic loss to the Fadama farmers and therefore discourages them from large scale Fadama farming. Also, most of the captured/killed wildlife pests could be endangered or threatened thereby negating the value or essence of wildlife conservation principles. However, this fear can be minimized through well planned education and awareness campaign, Agro forestry practices and integrated farming system, (IFS).

6. RECOMMENDATION

1. Use of scare crow should be encouraged among local FADAMA farmers to scare particularly, the Avian species.
2. Farm patrol at regular intervals by both farmers and game patrol at team to study the movements of these animals should be encouraged into track them down.
3. Clearing of bushes in farm surrounding and inside the farms be carried out regularly to discourage the habitation of farms by these wildlife pests.
4. Introduction of wildlife extension services to educate farmers on wildlife conservation principles should be encouraged e.g. using integrated farming system.

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