

ENVIRONMENTAL ISSUES



VOL. 8, No. 1, 2018

**Published by: Department of Geography
And Environmental Management
Faculty of Social Sciences
University of Ilorin,
Ilorin, Nigeria**

Editorial Board

Dr. U. A. Raheem	Editor - in - Chief
Prof. E. O. Oriola and Prof. I.P Ifabiyi	Editors
Dr. N. A. Malik	Business Manager
Dr. K. A. Iroye	Member
Dr. (Mrs.) R. M. Olanrewaju	Member

Editorial Advisory Board

Professor. F. A. Adesina	Department of Geography, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.
Professor. Ayo Salami	Institute of Ecology and Environmental Management, Obafemi Awolowo University, Ile-Ife, Osun State, Nigeria.
Professor. E. O Igusi	Department of Geography Ahmadu Bello University, Zaria, Nigeria
Professor . A. A Adebayo	Department of Geography, Federal University of Technology, Yola, Nigeria
Professor. Temi Ologunorisa	Department of Meteorology Federal University of Technology, Akure, Ondo State, Nigeria
Professor. J. N Bello	Federal University of Agriculture, Abeokuta, Ogun State, Nigeria.
Professor. T. K. Gbadamosi	Department of Transport Technology Federal University of Technology, Akure, Ondo State, Nigeria.

Analysis of Wildlife Damage on Arable Farmland in Ekiti Local Government Area of Kwara State, Nigeria

¹Adefalu, L.L., ²Alausa, T.O., ¹Kareem, O.W., ¹Aderinoye-Abdulwahab, S.A.,
¹Dolapo, T.A. and ¹Adeoye, D.D.

¹Department of Agricultural Extension and Rural Development, University of Ilorin, Ilorin, Nigeria

^{*}Corresponding author e-mail: abdulkareem.wahid@gmail.com

²Department of Forest Resource Management, University of Ilorin, Ilorin

Abstract: Wildlife has been the beauty of game reserve and parks as tourists attraction centres for decades in Nigeria. This had led to the rake of huge foreign earnings for the country but the damage done to arable crops by this same wildlife has called for serious concern. The aim of this study was to analyze the wildlife damage on arable farmland in Ekiti Local Government Area of Kwara State, Nigeria. A multi-stage sampling technique was used to select 120 respondents for the study. Data were collected through structured interview schedule. Descriptive statistics such as frequency counts and percentages while Pearson product correlation coefficient was employed to test the hypothesis. Findings from this study revealed higher percentage of male farmers to female; 64% and 36% respectively. About 33% of the respondents got income of N21, 000 per month while 28% earned N21,000 - N31,000 monthly. It was also revealed that greater proportion of the respondents (87%) experienced crop damage from wildlife while 13% have not experienced any damage from wildlife. Grasscutter posed most damage followed by monkey, then bush rat while maize was the most attacked crop followed by cassava and yam. The month of July -September was revealed as the time of the year with high damage while night was the time of the day when the damage was mostly carried out. The correlation analysis showed that educational status ($r = -0.738$, $p = 0.026$) marital status ($r = 0.451$, $p = 0.015$) and household size ($r = 0.578$, $p = 0.006$) were significant to the frequency of preventive measures against wildlife damage on arable farmland. However, age ($r = -0.180$, $p = 0.555$), sex ($r = 0.250$, $p = 0.257$) secondary occupation ($r = 0.220$, $p = 0.398$), religion ($r = -0.17$, $p = 0.453$) and income ($r = -0.270$, $p = 0.453$) were found to be insignificant. The study therefore, recommends that the government should consolidate wildlife conservation policy by introducing more game reserves to checkmate the multiplying number of wildlife that destroy valuable farm crops and create awareness campaign on poaching and indiscriminate killings of wildlife by the crop farmers, hunters and poachers across the country.

Key words: Poachers, Tourists, Preventive measures, Game reserve, Decimation

Introduction

There has been so much written about insect damage to crops, but an area that has received little attention within agricultural development and conservation, and primatological literature is that of wildlife and the potential damage they can cause to farmers' arable farmland. Arable crops production is often marred by the incursion of animal pest and this could lead into the damage or decimation of farm yield. There has been little or no attention paid to wildlife damage on crops particularly on small arable farms in sub- Sahara Africa region. Catherine (2000) however, stated

evidence abounds that wildlife damage on arable

crops is not a new phenomenon. Certain species of primates are very successful including crop raiders with their extensive migratory social behavior, opportunistic life style, non-specialized and omnivorous dietary tendencies. Primates such as baboons are highly adaptable and take readily to living alongside human in rural or sometimes urban and semi urban settings (Forthman-Quick, 1989; Gupta, 2013 and Hoare and Toit, 1997).

Crop losses experienced by individual farming household or agricultural communities do not only create fear in the

mind of the farmer but as such reduce the yield and productivities of the farm. Crop losses to wildlife are not just mere economic losses on the fortunes of arable crop farmland in the rural communities. Losses can generate other cost to household members including an increasing need to guard arable farmland which create labour bottlenecks in certain period of the year, disruption of schooling because children are needed to help guard family farmland, increasing risk of injury from wildlife and an increased risk of contracting diseases if people are required to guard their farms at night (Hill, 2000; Naughton-Treves, *et al.*, 2003 and Tchamba, 1996). Furthermore, wild animals are fast becoming wiser to the extent that the use of preventive measures such as scare crow and other devices are no longer effective in the prevention of arable farm damage. The dearth of information on improved preventive measures against arable farm damage by wildlife necessitates this research. The study however, sought to analyze wildlife damage on arable farmland in Ekiti local government area of Kwara state.

Definition of terms

Arable Farmland: This is a land capable of being ploughed and used to grow crops. (Oxford, 2013)

Wildlife: This traditionally refers to non-domesticated animal species but has come to include all plants and fungi and other organisms which grow or live wild in an area without being introduced by humans. (Usher, 1986)

Crop damage: This is any reduction in quantity or quality of yield that results from injury caused by environmental factors, chemicals, or pests

Pest: A pest is "a plant or animal detrimental to humans or human concerns (as agriculture or livestock production)" alternative meanings include organisms that cause nuisance and epidemic disease associated

with high mortality (specifically: plague). In its broadest sense, a pest is a competitor of humanity.

Hypothesis

H₀₁: There is no significant relationship between some selected socio-economic characteristics of the respondents and preventive measures against wildlife damage.

Methodology

The population for this study comprised arable crop farmers in Ekiti Local Government Area of Kwara State. A multi-stage sampling technique was employed for the selection of respondents. The first stage involved the purposive selection of 3 communities where arable crops are regularly cultivated. The second stage involved the random selection of two farmers' association from each of the communities and the third stage is the random selection of 20 farmers from each farmer's association. The sample size of 120 respondents was used for the study. Interview schedule was utilized to elicit information from the respondents. The information obtained were processed into data and analyzed with descriptive statistics such as; frequency count and percentages while Pearson product correlation coefficient was used to test the hypothesis.

Results and Discussion

Socio-economic characteristics of the respondents

The result from Table 1 shows that 2.5% of the respondents were 24 years of age and below while 15.8% were between 25-34 years. The active age of the farmers were in the categories of 35-44yrs (25%) and 45-54yrs (31.7%) while 1.7% of them were above 75 years of age. The table showed higher percentage (64.2%) to be male while 35.8percent were female. This implies that the preponderance number of

Environmental Issues

the respondents were male. The largest percentages (71.7%) of them were married while least percentage (2.5%) was single. In term of education, the majority (30.0%) of the respondents had quranic education, 20.8% of them had secondary education, and 8.3% had tertiary education. This is a pointer that the respondents were literates. For secondary occupation, the majority (31.7%) was into trading, 30.0% were hunters and (16.7%) were civil servants. This could be ascribed to various damages they had suffered from wildlife invasion on

Respondents' experience of crop damage by wildlife

From Table 2, the result showed that a greater percentage (86.7%) of the respondents has experienced crop damage from various wildlife animals and 13.3percent have not experienced any crop damage from wildlife. This indicates a high magnitude of attack being experienced by the farmers in the study area and can seriously affect the livelihood of those farmers. This can also lead to increased negative human attitude towards wildlife with potentially negative effects for conservation. This finding is buttressed by Gureja *et al.*, (2005) who opined that economic loss through wildlife is a considerable threat to animal conservation due to increasing resentment among the residents that may result into retaliation.

volume (8) 2018

their various farms. Of 120 respondents, the majority (47.6%) had 6-10 household size, 44.2% had household size of 0-5 while 1.7% had 16-20 household size. This implies that, the respondents had sizeable number of dependents which could be spared as farm labours and guards against wildlife attack. On the average monthly income, the majority (33.3%) had 11,201-21,200, 5.8% had 31,201-41,200, and 1.7% of the respondents had above 91,201. This means that the respondents were running good agribusiness.

The rate of crop damages done by wildlife animals

Figure 1 revealed that damages caused to crop by wildlife were different from one crop to another. The damage caused to maize and cassava was very severe, yam is severe, and cowpea was equally severe. Millet and sorghum had mild severity of attack. This implies that, the wildlife in the area had preference for a particular type of crops since it is evident in previous research studies that different animal species have special interest in different types of crops and the level of damage also differ. This study is consistent with Aparna, 2013 who opined that forty seven species of crops are vulnerable to animal damage and the most nutritious one are more vulnerable whenever wildlife visit any farm to cause damage

Table 1: Socio-economic characteristics of the respondents

Socioeconomic variables	Operationalization	Frequency	Percentage
i. Age	< 24	3	2.5
	25 - 34	19	15.8
	35 - 44	30	25
	45 - 54	38	31.7
	55 - 64	18	15
	65 - 74	10	8.3
	> 75	2	1.7
ii. Sex	Male	77	64.2
	Female	43	35.8
iii. Marital status	Single	16	13.3
	Married	86	71.7
	Divorced	15	12.5
	Widowed	3	2.5
iv. Education	No formal	15	12.5
	Tertiary	10	8.3
	Secondary	25	20.8
	Primary	34	28.3
	Quranic	36	30.1
v. Religion	Christianity	81	67.5
	Islam	29	24.2
	Traditional	10	8.3
vi. Household size	0 - 5	53	44.2
	6 - 10	57	47.6
	11 - 15	7	5.8
	16 - 20	2	1.7
	21 above	1	0.8
vii. Secondary Occupation	Hunting	36	30
	Artisans	26	21.7
	Trading	38	31.7
	Civil servant	20	16.6
viii. Av. Monthly Income	< 1,200	1	0.8
	1,201 - 11,200	29	24.2
	11,201 - 21,200	40	33.3
	21,201 - 31,200	34	28.3
	31,201 - 41,200	7	5.8
	41,201 - 51,200	5	4.2
	51,201 - 61,200	2	1.7
	61,201 above	2	1.7

Source: Field Survey, 2014

Table 2: Respondents' experience of crop damage by wildlife

Variables	Frequency	Percentage (%)
Yes	104	86.7
No	16	13.3
Total	120	100

Source: Field Survey, 2014

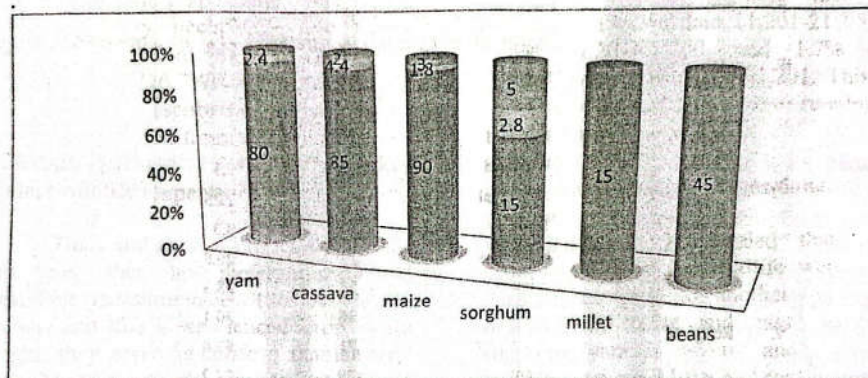


Figure 1: Showing the rate of crop damage done by wildlife

The wildlife causing damage to crops

The result in figure 2 showed that grass cutters, monkeys and bush rats were the most dominant wildlife in the area that cause destruction to farmers' crops. Squirrel, quail and rabbit caused little damage; this is an indication that some animals preferred some kinds of crops to another; this could be ascribed to monkeys that usually move in group whenever they want to inflict damage on farm crops. This research finding is buttressed by Brian *et al.*, 2005 who confirmed that small mammals such as fox squirrels, ground squirrels, rabbits, birds and

other wildlife in that category had little effect on farmers' crop field. Woodroffe *et al.*, (2005), Chauhan and Singh, (1990) and Naughton-Treves, (1997) also attested that raiding by Asian elephant (*Elephas maximus*) and African elephant (*Loxodonta africana*) leads to visibly obvious damage over a measurable area whereas smaller to medium sized herbivores like, blackbuck (*Antelope cervicapra*), nilgai (*Boselaphus tragocamelus*), chital (*Axis axis*), wild pig (*Sus scrofa*) etc. may chew or nibble some specific parts of a plant such that the damage is not obvious at a glance but yields can be affected significantly.

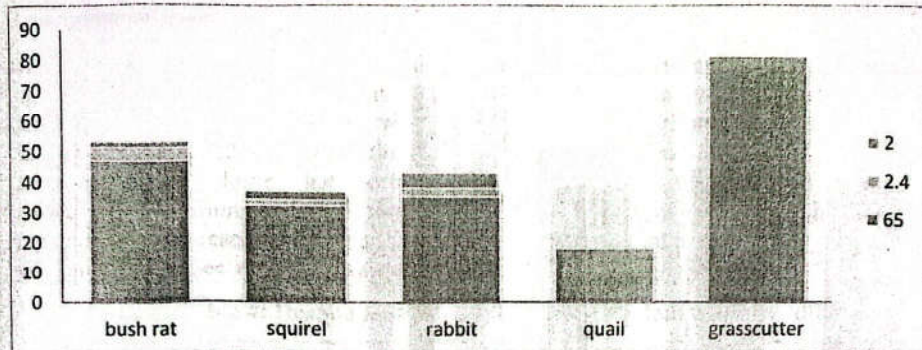


Figure 2: Showing the wildlife causing damage to the crops

Different preventive measures taken against wildlife damage

Traps and snare were said to be the best and the most commonly used preventive measures against wild animals' damage and this is so because if they are caught, they serve as food to the farmers. Also, hunting was the second most used measure which explains why good percentage of the farmers' secondary occupation is hunting in the study area. This finding is at variance with that of Aparna (2013) who stressed that the use of a variety of control techniques is essential since the offending species can become accustomed

to a single method over a long period of time. As a result of this fact, traps and snare may not be effective as expected to mitigate wildlife damage on the farm. Sitati *et al.*, (2005) also confirmed in their study that destructive measures such as traps can kill or injure animals. Abhijeet *et al.*, (2016) also supported that patterns of damages caused by different herbivores can be substantially different and estimating them using a single method may not be possible or realistic.

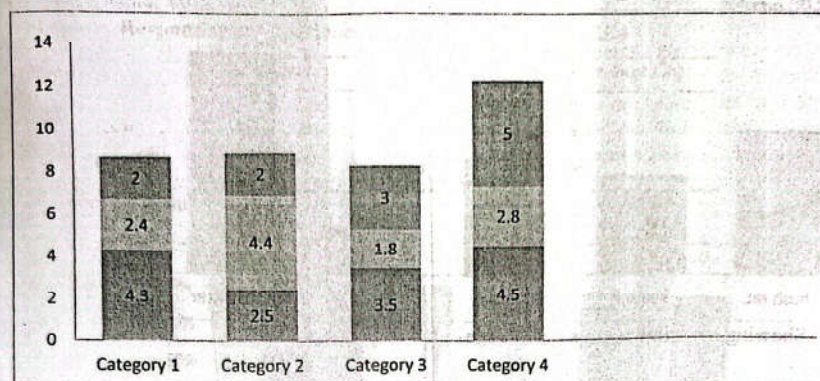


Figure 3: Different preventive measures taken against wildlife damage

Table 3: The expected yield (kg) per acre of land of the respondents

Variables	Frequency	Percentage (%)
< 50	10	8.3
51-100	80	66.7
101-150	27	22.5
> 151	3	2.5
Total	120	100

Source, Field survey, 2014

The expected yield per acre of land of the respondents

The result showed that 66.7% of the respondents were expecting nothing less than 100kg as 8.3% were expecting less than 50kg per acre. This implies that the expectation of farmers is very high on farm output and could be devastating when their hopes are dashed through wildlife damage. However, interactions between wildlife and agricultural activities can at times result in severe damage to agricultural products that may bring out low yield. Conover (2002) in his study opined that most wildlife species have a benign or even beneficial effect on agriculture (e.g. songbirds and raptors help

Adefalu, L.L., Alausa, T.O., Kareem, O.W., Aderinoye-Abdulwahab, S.A., Dolapo, T.A. and Adeoye, D.D.

control pests) and this help in raising the tonnage expected from the farm but the relatively few species that feed on crops, stored feed or livestock can cause yield losses, livestock losses and damage to farm produce if precautionary measures are not taken.

The respondents' yield after the damage by wildlife

The result in Table 4 indicated that 50% of the respondents had 51-100kg of produce after recorded damage from wildlife. It is therefore, clear that the actual yield harvested do not match the expected yield. This could be deduced that the

damage done to crops by wildlife significantly lowered the respondents' yields expected. This is in congruent with the finding of Conover (2002) who estimated in terms of economic losses that most of the people whose farming activities are often impacted by the presence and abundance of wild animal species are the resource poor

local subsistence farmers. Mathur *et al.*, (2015) equally concluded in their findings that agricultural lands close to protected areas often face crop raiding by wild herbivores, which can be a serious problem for farmers whose livelihoods depend on agricultural produce.

Table 4: Respondents' yield (kg) after the damage by wildlife

Variables	Frequency	Percentage (%)
<50	40	33.3
51-100	60	50.0
101-150	12	10.0
>151	8	6.7
Total	120	100

Source; Field survey, 2014

Different time of the day wildlife attacked farmers' crops

As depicted in figure 4, most damage is done in the night followed by the evening while the least damage is done in the morning which could be as a result of the presence of the farmer on the farm every morning. This shows the wildlife was not attacking the farm crops when the farmers were working on the farms. This implies that some animals are nocturnal, that is, very active at night when nobody present in the farm to unleash damage on farmers crop field. It is also evident from the previous

literatures that some farmers used to put on their radios while working on the farm during the day to make farm work more enjoyable by listening to different entertainment programmes, music etc., this plays a vital role in scaring the wildlife away from the vicinity and that is the reason why some of these wildlife invade such farms in the night when farmers are already having bed rest.

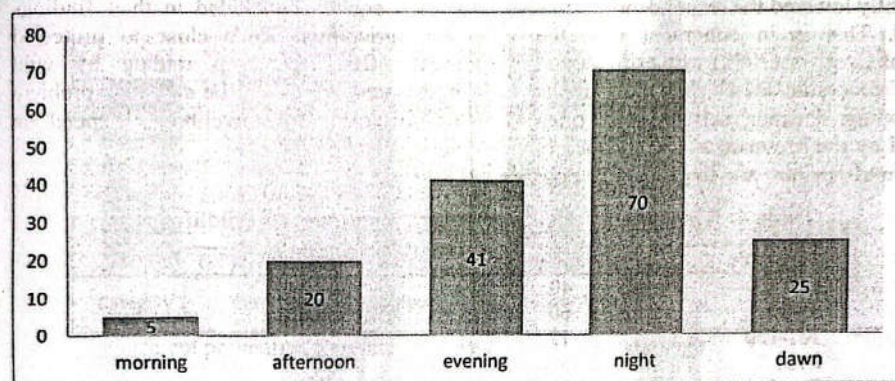


Figure 4: Showing different periods of the day wildlife attacked farmers' crops

Result of tested Hypothesis

The correlation analysis showed that marital status ($r = 0.451$, $p = 0.015$), household size ($r = 0.578$, $p = 0.006$) and the preventive measures against wildlife damage were positively significant except educational status ($r = -0.738$, $p = 0.026$)

which was negatively significant. Therefore, the null hypothesis which stated that, there is no significant relationship between selected socio-economic characteristics and preventive measures against wildlife damage is rejected.

Table 5: Hypothesis testing

Variables	Coefficient (r)	P-value
Marital status	0.451	0.015**
Educational status	-0.738	0.026**
Secondary occupation	0.220	0.398
Household size	0.578	0.006**

**Correlation is significant at 0.05 (2-tailed)

Environmental Issues Recommendations

It is noted from the foregoing that the major species of wild animals causing damage to crops on arable farmland are categorized as least concern by the IUCN. However, it is important for wildlife conservation and extension agencies to periodically engage local farmers in community-wide conservation education with special reference to endangered animal in their communities. The focus of the conservation education should be to prevent attack against endangered wildlife species and their habitat. Farmers in areas susceptible to wildlife damage of their arable farmland should also cultivate less attractive crops such as chili and other capsicum species as hedge plants. It is important for conservation and extension agencies and local farmers to jointly review all options to mitigating human-wildlife conflict wherever they occur in order to raise tolerance for wildlife encounters among affected households.

References

- Abhijeet, B., Dilip, T., Ashok, D., Aravind, P.D., Rasika, P. and Milind, W. (2016). Assessment of crop damage by protected wild mammalian herbivores on the Western Boundary of Tadoba-Andhari Tiger Reserve, Central India. *PLOS ONE* 11(4): e0153854. <https://doi.org/10.1371/journal.pone.0153854>.
- Aparna, C.B. (2015). Crop damage by mammals in some villages of Washim District, Maharashtra, India. *Journal of Global Bioscience*, 4(1). Pp. 1954 – 1960.
- Brian, J.J., Lee, A.H., James, C.B., Travis, L.D., Monica, I.R. and Olin, E.R. (2005). Corn and Soybean Crop Depredation by Wildlife. Department of Forestry and Natural Resources. Purdue University. United States of America.
- Catherine, M.H. (2000). Conflict of interest between people and baboons: crop breeding in Uganda. *International Journal of Primatology* 21 (2). Plenum Publishing Corporation.
- Chauhan NPS and Singh R. (1990). Crop damage by overabundant populations of nilgai and blackbuck in Haryana (India) and its management. *Proceedings of 14th Vertebrate Pest Conference*. Paper 13. 218–220.
- Conover, M.R., (2002). *Resolving Human-Wildlife Conflicts: The Science of Wildlife Damage Management*. Lewis Publishers, Boca Raton (Florida).
- Forthman-Quick, D. L. (1986). Activity budgets and the consumption of human foods in two troops of baboons (*Papio anubis*) at Gilgil, Kenya. In *Primate Ecology and Conservation*. Else, J. G., and P. C. Lee, eds. pp. 221–228. New York: Cambridge University Press.
- Gupta, A.C., (2013). Elephants, safety nets and agrarian culture: understanding human-wildlife conflict and rural livelihoods around Chobe National Park, Botswana. *J. Polit. Ecol.* 20, 238–25.
- Gureja, N, Menon V, Sarkar P, Kyarong S. Ganesh (2002). Human-elephant conflict in Sonitpur district of Assam. Wildlife Trust of India (New Delhi). Occasional report no. 6.
- Hill C.M. (2000). A conflict of interest between people and baboons: crops raiding in Uganda. *International Journal of Primatology*; 21 (3) 244–250.
- Hoare, R.E., and du Toit, J.T., (1999). Coexistence between people and elephants in African savannahs. *Conserv. Biol.* 13, 639–663.
- 105 Analysis of Wildlife Damage on Arable
- Adefalu, L.L., Alausa, T.O., Kareem, O.W., Aderinoye-Abdulwahab, S.A., Dolapo, T.A. and Adeoye, D.D.

Environmental Issues

- Mathur V.B., Kaushik M., Bist S.S., Mungi N.A., Qureshi Q. (2015). Management of human-wildlife interaction and invasive alien species in India. Report no. TR 2015/004. Wildlife Institute of India, Dehradun. pp.1-235.
- Naughton-Treves, L., Mena, J. L., Treves, A., Alvarez, N. and Radeloff, V. C. (2003). Wildlife survival beyond park boundaries: The impact of swidden agriculture and hunting on mammals in Tambopata, Peru. *Conservation Biology*. 17:1106-17.
- Naughton-Treves L. (1997). Farming the Forest Edge: Vulnerable Places and People Around Kibale National Park, Uganda. *Geogr Rev.* 87 (1): 27-46.
- Oxford Advanced Learner's Dictionary (2013). New Edition. Oxford University Press.

volume (8) 2018

- Sitati N.W, Walpole M.J., Leader-Williams N. (2005). Factors affecting susceptibility of farms to crop raiding by African elephants: Using a predictive model to mitigate conflict. *J of Applied Ecol.* 42:1175-1182.
- Tchamba, M.N., (1996) History and preset status of the human-elephant conflict in the Waza-Lagone region, Cameroon, West Africa. *Biol. Conserv.* 75, 35-41.
- Usher, M. B. (1986). '*Wildlife conservation evaluation: attributes, criteria and values*'. London, SSS New York: Chapman and Hall. ISBN 978-94-010-8315-7.
- Woodroffe R, Thirgood S, Rabinowitz A. (2005). *People and Wildlife: Conflict or Coexistence*. Cambridge University Press.