International Journal of Organic agricultural Research & Development
Volume 19 (2024)

SOCIO-ECONOMIC UTILIZATION OF WILD AQUATIC RESOURCES LEADING TO BIODIVERSITY LOSS IN IBARAPA CENTRAL OF OYO STATE, NIGERIA

Ajibade, A.O[1]., Ayodele, I.A.[2], Adetuga, A.T[2]., Taiwo, A. O[3], Olawumi, L. y.[1.] and Bello, I.T.[1].
[1]Department of Fisheries Technology, Oyo State College of Agriculture and Technology, P.M.B. 10, Igboora.
[2]Department of Wildlife and Ecotourism, University of Ibadan, Oyo State, Nigeria.
[3]Department Agricultural Extension, Oyo State College of Agriculture and Technology, P.M.B. 10, Igboora.
Corresponding author: ajibadeyemi@yahoo.com

ABSTRACT

The unlimited exploitation of aquatic wildlife in the natural water bodies is a threat to their continuous existence and sustainability. This study therefore identified the distribution and degree of utilization of wild aquatic and terrestrial resources in Ibarapa Central Local Government Area. Two main markets were sampled through the wildlife traders called 'Lekuleja'. Questionnaires and purposive sampling techniques were used by targeting the wildlife traders, selected buyers of wildlife and traditionalists. Slovin"s formula also helped in the choice of adequate representation of the sampled population. Women were the sole operators of the aquatic wildlife trade and are called 'Lekuleja'. Utilization of the aquatic resource, in descending order, recognizes medicinal /traditional use (50.9%), economic use (39.6%), nutritional use (10.5%), and industrial use (0.0%). The most exploited aquatic classes are the fin fishes and amphibians; contributing abundantly to trade volume at 21.1% and 10.5%, respectively. Traditional use accommodated diverse application to better the survival of rural dwellers such as anti-car accident, increase in sexual drive, and curing infertility in women. Nutritionally, all are edible except the African clawed toad. All are sources of economic empowerment by sale. Rational utilization of these resources should be employed through regulation by local government authority to avoid extinction through the wildlife traders. Wildlife reserves through established parks and dams should also be proactive towards conservation while ecotourism should be encouraged.

Keywords: Utilization, Aquatic resources, Socio-economic, Ibarapa, Oyo State.

INTRODUCTION

The importance of wildlife as a renewable natural resource and dependence of West Africans on these resources cannot be under estimated. Wildlife, encompassing terrestrial, aquatic and arboreal organisms, is food for some, symbol of culture for others or objects of religion and identity for many (Ajayi,1979 FAO, 2014). Traditionally, wildlife has been a valuable community asset and was used and protected by customs and taboos (Asibey, 1974). However, the acceptance and widespread of western education and scientific reports have contributed to the break-down and loss of these taboos, and further exposed the wildlife resources and ecosystem to serious threats of depletion. Over-exploitation of West African wildlife is therefore a threat to destroy the food resources, traditional / cultural values and income generation in many rural areas.

There is a need to make popular the need for wildlife management through rational utilization of wild aquatic resources in rural communities of Nigeria through public institutions and non-governmental organisations to achieve substantial conservation measures in the global communities through popular institutions such as the International Union for Conservation of Nature (IUCN) and Universities. This is in agreement with the report of Ayodele *et al.* (1999) that emphasized the general goals of wildlife management to embrace preservation of species, maintenance of population of useful species, stabilizing or decreasing population of certain species, and limiting utilization to annual production capacity.

The goal of wildlife conservation is to ensure that nature will be around for future generations to enjoy, and to recognize the importance of wildlife and wild lands to humans (Smith, 2010). The medicinal importance of wild plant, wild fish and animals with their product in healing physical illness or as ante-natal care is well recognized in West Africa (Burkill, 1985). This medicinal use is further enhanced while access to hospitals is difficult or non-existing as the people make-do with traditional medicine based on plants and animal products (Kerharo and Adam, 1974). Consequently, major towns and cities in West Africa are blessed by markets where parts of plants and animals are being traded by retailers for diverse purposes.

Therefore, the present study investigated the status of wild animal retailers in major markets of Igbo-Ora as a meeting point of trade and distribution of aquatic species in the wildlife trade through the retailers called 'Lekuleja'. The result helped to quantify the degree of loss of aquatic resources by identifying the wildlife resources in use and identification of specific use in Ibarapa as a local community.

METHODOLOGY

Two main markets (Towobowo and Oja Oba) were adequately involved during visitation and investigation. The total wildlife traders locally known as Lekuleja (if cut into two syllables, 'Leku' means the display of rodents for marketing while 'Leja' equals the display of fish for sale (a term in use by the Yoruba tribe in South-Western Nigeria) in the two markets were 21. Although all were accessible, Slovin"s formula was used to determine the appropriate sample size of 19.

Slovin's formula(n) = N / (1+ Ne^2) : where n = appropriate population to be sampled, N = total population concerned, e = allowable degree of error = 5 % for biological experiment.

Furthermore, 20 structured questionnaires were designed and distributed to wild-life traders as a purposive sampling technique. The structured questionnaires were sub-divided into three (3) sections to accommodate the status of trader (Section A), status of retail aquatic resources (Section B), and distribution of use (section C). Also, in-depth-interview with twelve (12) old traditionalists and two herbalist (one male and one female) served as key-informants that revealed the detail-use(s) of the various aquatic wild-lives. Consequently, overcoming the challenge of professionalism / Secrecy, factor of time and cost of research. All these served as sources of primary data. Secondary data were also sourced and applied to serve as foundation and achieve comparison.

Statistical tool applied in this research is descriptive statistics which involved means and percentages.

Results:

Table 1 below shows the distribution of utilization among users (buyers) of wildlife resources in Ibarapa Central Local Government Area. Economic enhancement took priority (70.18 %) followed by nutritional use (19.3%) because of its delicacy while the industrial use (0.0%) is unrecognized.

Also, Table 2 expressed the demographic information of the wildlife traders where male involvement was 0.0% compared to a female involvement of 100.0%. Hence, only female engage in wildlife trading. The age distribution of the traders revealed 0.0%, 36.84%, and 63.15% for age-bracket of ≤ 20 years, 20 -50 years and those above 50 years, respectively. Participation of unmarried ladies was low compared to married women at 84.21% involvement in the wildlife-trade.

The relative price contribution of each of the wildlife commodities are captured in Table 3. The skin of *Panthera leo* (Lion) or *Panthera pardus* (Tiger) recorded the highest contribution (43.137%) to the economy of the wildlife traders in the two markets. This was followed by the contribution of Vulture (13.804%), Monkey (10.353%), Head of a Vulture (6.212%), live Parrot (5.176%), Big head of Snake (3.451%), smoked Parrot (2.588%), mature duck (1.5530%), Alligator lizard (1.380%), small head of snakes (1.380%), Turtles / Tortoise (1.035%), Horn of bushbuck (0.690%), *Gymnarchus niloticus* (0.518%), Live Chameleon (0.500%), Toad (0.04%), weaned Duck (0.500%), Head of tortoise (0.345%), Hedgehog (0.431%), African catfish (0.345%). and other low contributors such as Electric fish, *Chrysichthys nigrodigitatus* and horn of duikers in the current year. A range of 20.0 to 95.8 % was recorded as a general increase in price of wildlife product in a space of ten years. This is evident because the year 2014 recorded relative price contributions of 53.44%, 12.933%, 5.748%, 5.178%, 2.299%, 3.449%, 2.874%, 1.437%, 1.437%, 0.0718%, 0.431%, 0.287%, 0.086%, 0.172%, 0.287%, and 0.086% for skin of Tiger or Lion, Monkey, live Parrot, Vulture, Head of a vulture, Big head of Snake, smoked parrot, mature duck, Alligator lizard, Turtles / Tortoise, horn of bushbuck, live chameleon, *Gymnarchus niloticus*, head of Tortoise, Hedgehog, African catfish (*Clarias gariepinus),* respectively.

Discussion

The demographic information of the wildlife traders as shown in table2 revealed a complete dominance or involvement of females (100%)

in the wildlife trade. Principally, married women (about 84.2%) or ladies of marriageable age (more than 20 year old) were involved in the trade. Also, none of the wildlife traders practice other trade as additional source of income. All operates the wildlife trade as a sole business. This indicates the ability of wildlife trade in enhancing self-sustenance in the sub-urban or rural communities. FAO (2000) similarly reported a substantial proportion of the household income as a derivation from the sale of animal and wild animal products in Africa.

The popularity of use among the buyers and the wildlife traders (Table 1) favored economic use (object of trade) at 70.18%. This was followed by the medicinal / traditional use in a bid to protect or preserve the life of man at 19.30% in the current study. Likewise, the nutritional use as occasional food ingredient was supported by a few users because a direct consumption was never the target of most buyers ; except when traditional or medicinal use requires such preparations in the recipes by the herbalist / traditionalist in the current study. Similarly, the diverse use of wild animals and their parts in the culture, religious festivals and traditional medicine in Nigeria has been reported by Ajayi (1979) and Cambridge University Press (2009). Additionally, majority of the wildlife products are sold in dry-form by smoking. Hence, only a few of them are sold fresh or alive. Those usually on live-offer include snails, tortoise, turtles, electric fish, and chameleon. However, the last four years witnessed non-availability of live-electric fish in the markets. This could be partly due to over-exploitation of the resource by the hunters over the years. FAO (2017), also reported trade of wildlife in many forms and for multiple purposes such as direct sale of live animals (from zoos, collections, breeding, ranching and as pests) and sale of animal parts ; wild meat called bush meat in tropical and sub-tropical forests, skins, leather, fats, blood, oils (for cosmetic), sale of bones and shell apart from serving as medicinal ingredients, hunting trophies and tourist curios.

The relative price helped to quantify a unit of each product on the shelf of each trader as shown in Table 3. The cumulative contribution of each class or group of animals to the volume of trade indicated the dominance of terrestrial wild-lives ($\geq$ 60.0% ; 75.0%). This was followed by birds ($\geq$ 25.0% ; $\geq$ 15.0%), reptiles ($\geq$ 7.0% ; 5.0%), fish ($\geq$ 5.0% ; $\geq$ 2.0%), and amphibians ($\geq$ 0.11% ; $\geq$0.08%) in the year 2024 and 2014, respectively. This similarity in the general trend of offer or demand for wildlife products in the chosen years, over a space of ten years, pointed at a similar order of preference over a decade during utilization; using the cumulative relative price. However, the summation revealed an increase in demand and supply of birds, reptiles, fish and amphibians but a decrease for terrestrial wild-lives from the year 2014 to 2024. The sharpest increase in supply and demand was recorded in the bird and fish categories with a cumulative relative price margin of 10.0 and 3.0.0%, respectively. However, a sharp increase or inflation was generally recorded in the price tag of the items between the year 2014 and 2024 in the trade at Ibarapa Central community of Nigeria (Table 3). A range of 20.00 to 95.83 percent was recorded as rate of inflation in the price of wildlife products in the current study. Consequently, a mean value of 57.92 percent of inflation in price of wildlife products was observed at the concern markets between 2014 and 2024. Therefore, the main drive for dealing with animal products from the wild in Ibarapa Central Local Government Area pointed at financial and spiritual/medicinal needs. Although, some could use them as items of social functions such as naming ceremonies, burial, and objects of prayer during wedding ceremonies (Ajibade *et al.,* 2009). Similarly, five broad motivational categories were identified by Thomas-Walters *et al*. (2020) as experiential, functional, financial, social and spiritual needs of the people involved in wildlife hunting and trade.

Consequently, there is a high tendency for some animals and wildlife products to be threatened and endangered in the coming years. For example, life electric fish (*Malapterurus electircus)* is no longer available at the two central markets understudied while the head of vultures are becoming too expensive because of scarcity unlike a decade ago. This can be partly explained due to continuous disturbance by crop farmers, hunters and pastoralists, and concurrent bush burning during the dry seasons as captive technique plus the use of obnoxious fishing methods in the local communities.

The danger and threat on wild animals plus possibility of extinction due to illegal trade have been similarly reported by United Nations General Assembly (2017). Also, pressure of overexploitation was reported due to uncontrollable harvest and use of wildlife and wildlife-products by Challender and MacMillan (2014). All these negative indices on wildlife conservation have led to some effective management solutions in limiting illegal wildlife trade such as restricting supply through trade bans, improved custom checks, and anti-poaching measures by Phelps *et al*. (2014) in other parts of the world.

CONCLUSION

The pivotal point of exchange of wildlife and wildlife products in Ibarapa Central Local Government is the wildlife marketers called the 'Lekuleja'. These central traders of wildlife receives their goods chiefly from traditional hunters, rural-farmers and pastoralists because of their constant interactions with the wild environment. There is a need, therefore, to educate the wildlife traders towards conservation measures and legal implications of trading in restricted wild lives. This action will serve as an indirect avenue in reaching the suppliers of wildlife and wildlife products; especially awareness towards rational utilization of some products while zero harvest should be placed on some wild lives for some years to achieve rejuvenation in specific domain. The rapid inflation in the price of wildlife products per decade makes the business more attractive to the traders as a promising avenue for self-sustenance of immediate households. Restrictions should be placed and enforced on the indiscriminate harvest of electric fish (*M. electricus*) and silver catfish (*Chrysichthys nigrodigitatus)* per time because of their extreme decrease in size and quantities. Otherwise, the practice of deliberate culture should be encouraged.

REFERENCES

Ajayi, S.S. (1979). Utilization of Tropical forest wildlife: State of knowledge and research priorities. Eight World Forest Congress, Jakarta, Indonesia. 32 pp.

Ajibade, A.O., Ayodele, I.A. , Alarape, A.A. and Adesina, B.T. (2009). Socio-economic utilization of honey in Oyo State, Nigeria. Obeche journal, 27 (2): 80-83, University of Ibadan.

Asibey, E.O.A. (1974). Wildlife is a source of protein in Africa south of the Sahara. Biological conservation, 6 (1) : pp 32- 39.

Ayodele, I.A., Ebin, C.O. and Alarape, A.A. (1999). Essentials of Biodiversity Management. Jachin Publishers, Ibadan, Nigeria.

Burkill, H.M. (1985). The useful Plants of West Africa. 2nd Ed. Vol. Families A-D. Royal Botanical Garde, Kew. 218-223pp.

Cardinale BJ, *et al*. (2012). Biodiversity loss and its impact on humanity. Nature, 489: 326-326.

Challender DWS and Macmillan (2014). Poaching is more than enforcement problem. Conservation letters, 7 : 484 – 494.

Challender DWS, Harrop, SR, MacMillan DC. (2015). Towards informed and multi-faceted wildlife trade interventions. *Global ecology and conservation,* 3; 129-148.

FAO (2000). Indirect Contribution of Wildlife to Food Security. Available Online at https://www.fao.org/3/w7540e/w. Downloaded on April 06, 2024.

FAO (2017). Sustainable Wildlife Management. Available Online at https://www.fao.org. Vol. 68. No. 249.

Kerharo, J. and Adam J.G. (1974). Plant Medicinales et 17 Toxiques des Touchuleur du Senegal. J. Agr. Trop. Bota. App., Vol. 11 : 384-444.

Phelps, J., Carrasco L.R. and Webb, E.L. (2014). A framework for assessing supply-side wildlife

Smith., Pelps, J., Smith, R. J., Wan, A. K.Y. and Verrisimo, D. (2020). Motivations for the use and consumption of wildlife products. *Conservation biology*, Vol. 35 (2): 483- 491.

Thomas-Walters L., Hinsley, A. Beigin, D., Burgess, G., Doughty, H., Eppel, S., MacFarlane, D. Meijer, W., Lee, T.M conservation. Conservation Biology, 28:244-257.

United Nations General Assembly (2017). Resolution 71/326, Tackling illicit trafficking in wildlife (A/RES/71/326). Available Online from https://undocs.org/A/RES/71/326. Access 14th April, 2024.

Table 1: The demographic information of the wildlife traders are shown below

Characteristics	Description	frequency	Percentage
Sex	Male	0.0	0.0
	Female	19.0	100.0
Age distribution	< 20 years	0.0	0
	20 – 50 years	7.0	36.82
	>50 years	12.0	63.15
Supplemental occupation	Yes	0.00	0.00
	No	19	100.0
Marital Status	Single	2	10.5
	Married	16	84.21
	Divorced / Indifference	1	5.26

Table 2. Recognition of utilization among selected buyers

Serial Number	Specific group	Frequency	Degree of awareness
1.	Economic use	40.00	70.18
2.	Medicinal / Traditional use	11.00	19.30
3.	Nutritional use	06.00	10.53
4.	Industrial use	0.00	0.00
	Total	57	100

Table 3: The list of wildlife species under high exploitation and price variation

S/N	Specific Organism	Price in 2024	Relative Price Contribution in 2024 (%)	Price in 2014	Relative Price Contribution in 2014 (%)	Degree of Inflation (%)
1	Small Horn of duiker	500	0.086	200	0.059	60.0
2	Small Horn of buffalo	200	0.043	100	0.030	60.0
3	Horn of bushbuck	4000	0.690	1,500	0.448	62.5
4	*Gymnarchus niloticus*	3000	0.518	300	0.086	90.0
5	Malapterurus electricus	1000	0.173	400	0.115	60.0
6	*Clarias gariepinus*	2000	0.345	300	0.086	85.0
7	*C. nigrodigitatus*	1000	0.178	250	0.072	75.0
8	Turtles / Tortoise	6000	1.035	250	0.072	95.83
9	Head of tortoise	2000	0.345	600	0.172	70.0
10	Live chameleon	3000	0.500	1000	0.287	66-67
11	Dead Chameleon	500	0.086	200	0.057	60.0
12	African crab	500	0.086	100	0.029	80.0
13	Frog	400	0.070	200	0.059	50.0
14	Toad	200	0.040	100	0.029	50.0
15	Young duck (live)	3000	0.500	1500	0.431	50.0
16	Mature duck (live)	9000	1.553	5000	1.437	44.4
17	Monkey (live)	60000	10.353	45000	12.933	25.0
18	Pigeon (live)	1500	0.260	800	0.230	46.7
19	Small Birds	1000	0.172	600	0.172	40.0
20	Alligator lizard	8000	1.380	5000	1.437	37.5
21	Long mouth rat	1200	0.207	550	0.158	54.2
22	Small Head of African Python	8000	1.380	5000	1.437	60.0
23	Big Head of African Python	20000	3.451	12000	3.449	66.7
24	Complete skin of Leopard / Lion	250000	43.137	200000	57.480	20.0
25	Whole snake (African phyton)	30000	5.176	10000	2.874	66.7
26	Hedgehog (Lili)	2500	0.431	1000	0.287	60.0
27	Parrot	15000	2.588	10000	2.874	33.3
28	Live parrot	30000	5.176	20000	5.748	33.3
29	Vulture	80000	13.804	18000	5.173	77.5
30	Head of vulture	36000	6.212	8000	2.299	77.8

Table 4: Medicinal/ Traditional utilization of fishery resources in the study area

S/N	Wild-products	Specific Medicinal / Traditional use
1	Electric fish (*M. electricus*)	-Increase in sexual drive of men -Restoration of physiological activity in pregnant women
2	*Clarias gariepinus*	-Resistance to witchcraft dominance -Seeking pardon from spiritual elders
3	*Gymnarchus niloticus*	-Improvement of skin colour or youthfulness
4	*Chrysichthys nigrodigitatus*	-Concoction for mercy or forgiveness
5	African crab	-Production of love soup -Remedies for bone dislocation
6	African spurred tortoise/ turtle	- Head part for curing respiratory diseases and back -pain
7	Bulinus globosus	-Initiating pregnancy in barren women
8	African clawed toad	-A component in anti-ulcer preparation
9	African dwarf frog	-Application in anti -car accident preparation