



AN APPRAISAL OF CULTIVATED CROPS AND WILD PLANTS IN DAGONA WATERFOWL SANCTUARY, NIGERIA

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ABSTRACT

Environmental issues have, recently generated much interest among scholars or academics, administrators, politicians, students and environmentalists. But in the proper context or global environmental debate, it has become continuously difficult to separate the interrelationship between man, environmental resources and conservation measures. The study employs systematic sampling techniques in selecting the respondents for the interview. The selection was based on the settlement arrangement pattern in the study site as sampling frame. The structured questionnaires were administered to the respondents with aid of research assistant for proper interpretation of the questionnaire to local language (Bade). Cereals crop production especially millet thrive well due to its physiological ability to withstand adverse environment conditions. The study also finds that the protected areas is suitable for rice production. Several species of wild plants were exploited either for construction, income, medicinal purposes, fuel wood, and fodder. Grazing is another activity taking place in the study site due the availability of green pasture.

Keywords: Assessment, Crops, Plants, Protected Area, Waterfowl

INTRODUCTION

It is important to note that the survey of the sanctuary was first conducted in 1949 and followed by the establishment of a 300 date palm tree plantation in 1963 (Zimmerman, 2003). The then Borno Native Authority designated the area a Site of Special Conservation Interest (SSCI) in 1966 (Mbanyiman, 1990). Subsequently the area was declared a sanctuary on 17th February, 1987. As a measure of its international importance some prominent World Leaders at that time visited the sanctuary and they include Benhardt of Netherlands (President, WWF) in 1987, Prince Phillips Duke of Edinburgh, 1989, and Prince and Late Princess of Wales in 1990.

The ultimate goal of establishing Dagona waterfowl sanctuary is to improve the general quality of life of the people and to protect the environment. The success of any policy establishing a conserved or protected area depends largely on proper utilization and effective management by both the people and the concerned authorities, especially, the fact that all protected areas are social spaces (Manu, 2000). The conservation of the sanctuary is for resources protection and maintenance for future prosperity (IUCN, 1988).

The organizations involved in the conservation activities in the area includes Nigerian Conservation Foundation (NCF), the North East Arid Zone Development Program (NEAZDP), the Chad Basin National Park (CBNP), and the Hadejia-Nguru Wetlands Conservation Project (HNWCP). They are financial supported by international agencies such as the Royal Society

for the Protection of Birds (RSPB), the World Wildlife Fund for Nature (WWF) and the International Union for the Conservation of Nature (IUCN). The overall objectives of these organizations is to raise public awareness on conservation to protect the threatened species and habitats, encourage and fund conservation research project and promote sustainable utilization of maintainable resources (IUCN, 1988, Ayuba et al, 2002).

MATERIALS AND METHODS

The Study Area

Dagona Waterfowl sanctuary is part of the Bade-Nguru wetlands sector in Yobe state of Nigeria. The sector is found between latitudes 12°13' - 13°00'N and longitude 10°00' - 11°00'E. It covers an area of 9385 Km². The Dagona Waterfowl Sanctuary being the focal point of the sector made Dagona village the most important of all the villages in the Bade Local Government Area.

The Dagona Waterfowl Sanctuary is one of the three major ecological entities designated as fully protected areas under the control of Chad Basin National Park (Stopfords, 1999). It functions as a habitat for waterfowl. The area is a Fadama which is flooded in the wet season; it is endowed with diverse physical and biotic composition (Ipinjolu, 1999).

The area is situated in a semi-arid environment. The climate therefore is hot and dry for most part of the year. Temperature

risers up to 43°C in the hottest months of May to June, the dry season lasts from November to June, the rainy season starts in early July and ends in October. Rainfall is generally erratic in its distribution and amount; it roughly lasts for 120 days. rainfall values ranging from 23 mm to 335 mm, while the mean annual rainfall is about 180 mm. (Auwalu, 2004).

The vegetation is entirely Sahel savannah type which consist of mainly drought resistant tree species (xerophytes) such as Doum palm (*Hyphenia thebaica*), African Mahogany (*Khaya Senegalis*), Acacia species such as Gum Arabic (*Acacia nilotica*) Senegal gum (*Acacia Senegal*) Neem (*Azadiricta indica*) among others. Fishing, farming and hunting are the major economic activities in the area.

Systematic sampling technique was used to cover Dagona through which heads of households were selected as samples and interviewed as respondents. Their selection was based on their house arrangement which was used as sampling frame for this research work. The researcher skipped houses at regular interval of two (2) houses before conducting an interview exercise with another respondent. The interview exercise was conducted with each head of household selected as sample.

The questionnaire is divided into three (3) sections A, B and C where section A contained questions on the respondents'

personal profile while section B contained questions on environmental impacts assessment and section contained questions or items on socioeconomic (human activities) impacts assessment

The method of the questionnaire administration employed was self-administered method in which the researcher met the respondents in their respective places of resident to interview them. The choice of this method of questionnaire administration is largely due to the fact that quite a substantial number of the respondents are not literate enough to answer the questions on their own. The researcher sought the assistant of three persons who served as research assistants who are literate and also fluent in the dominant local language of the area which is Bade tribe.

A percentage method of statistics is adopted for the analysis. In rating the effectiveness of the conservation measures in the sanctuary, list of conservation measures were listed as options for the respondents to select the one that best suit their interest or opinion and out of these options or alternative conservation measures, the one that is chosen by the highest percentage of the people is now regarded as the most effective conservation measure in the sanctuary.

RESULTS AND DISCUSSION

Table 1: Socio-Demographic Characteristics of the Respondents

Age Group	Number or respondents		Percentage (%)	
Less than 18	10		3.1	
18-30	26		8.1	
31-43	40		12.5	
44-56	43		13.43	
57-69	50		15.62	
70-82	84		26.25	
83 and above	67		21	
Total	320		100	
Qualification	Number or respondents		Percentage (%)	
Degree or its equivalent	10		3.13	
Diploma or its equivalent	21		6.56	
SSCE or its equivalent	42		13.13	
Primary school	79		24.25	
Quranic education	132		41.25	
Others	36		11.25	
Total	320		100	
Occupations	Number of respondents		Percentage (%)	
	Before	After	Before	After
Crop Production	160	106	50	33.12
Animal rearing	56	53	17.5	16.57
Fishing	24	22	7.2	6.88
Hunting	41	39	12.81	12.18
Others (Civil Service and teaching)	39	100	12.19	31.25
Total	320	320	100	100

Source: Field work, 2018

Age Structure of the Respondents

Table 1 illustrates the age structure of the respondent where person below the age of 18 constitute only (3.1 %) which is a very insignificant percentage of the respondents while the age group 57-69 years represent (15.62 %). Overall, the age group 44 and above represent over 70% of the respondents. The active age group comprises of persons 18-42 years and they represent the youths, who are to be innovative and up to date with regard to conservation and environmentally consciousness.

Educational Qualification of the Respondents

Education being the basis for any meaningful development also serves as a weapon against poverty, hunger, ignorance and diseases. It can be seen from Table 1 that out of the entire respondent only 3.13% of the respondents are educated up to degree level and this is of course an ill-development. The highest percentage is Quranic Education with 41.25%,

Occupation of the respondents

Occupation of the respondents before and after the establishment of the sanctuary and from which it can be seen clearly that these is a little difference in the percentages for the occupations. Before the establishment of the sanctuary only 12.19% of the sanctuary were in civil service and trading but presently or after the establishment of the sanctuary the percentage of the respondents who are engaged in the civil services or trading has increased up to 31.25% this shows that there is occupational change among the respondents due to the establishment of the sanctuary in the area, Table 1.

The greater percentage of the respondents are farmers who are engaged in crop production before the establishment of the sanctuary 50% of the respondents are engaged in farming and specifically crop production but, subsequently after the establishment of the sanctuary the percentage of the respondents in crop production dropped to 33.12%. This shows one of the impacts of the sanctuary on human activities in the area. The percentage of the respondents who are engaged in animal rearing before the establishment of the sanctuary was 17.5% but later dropped to 16.57%. This similar trend applied to fishing and hunting. All these changes direct effects of the sanctuary on human activities. This liable also revealed it clearly that most of the people in the study area are directly dependent on natural resources for their livelihood.

Cultivated crops in the sanctuary their uses and ranking.

The culture in the study area and their ranking before and after the establishment of the sanctuary, according to the finding there are eight crops popularly cultivated in the area; Millet is ranked number one, by respondents both before and after the establishment of the sanctuary. While rice which used to be the second before the establishment of the sanctuary is presently ranked number four by the respondents. Sorghum which used to be number three is now number two, cowpea which used to be

the last crop on the list of crops produced in the area is now the third crop. All these crops as illustrated by the table are not cultivated for one use but rather they are cultivated for many uses.

Over 61.56% of the respondents believed that the protected area is best for rice cultivation their followed by unprotected area with 30% of the respondent while only 8.44% of the respondents home not yet decided on which land is suitable for rice cultivation, this is because most of the people in this last group are not farmers base of this study.

60.31% of the respondents believed that Rice is the most affected crop in the area due to the establishment of the sanctuary followed by Millet with 12.51% of the respondents. Wheat is also affected with 11.25% of the responses 10.31% of the respondents indicates that Guinea corn/Maize is affected by the establishment of the sanctuary. Bean is the least affected crop with only 5.32% of the respondents. The finding of this study shows Rice is the most affected by the sanctuary because birds which constitute the greater percentage of fauna population in the sanctuary destroys rice at several stage from germination to harvest.

The wetlands in the area provide suitable condition for growing food and cash crops for both wet and dry seasons. The area is notable for production of Rice, Millet, Corn, Wheat, Cowpea, Sorghum and Vegetables. Farming activities in the sanctuary is destructive due to poverty and population pressure. According to the National Population Commission (NPC, 2006) the population is increasing as such there is increase in the demand to expand farms. The rate at which farmlands are expands today, if allowed unchecked will cause serious environmental problem. Unsustainable cultivation of land and clearing of the sanctuary to provide food for man and animal is a continuous phenomenon despite its effects on the fertility of the soil and resources. The socioeconomic status of the Dagona people forced them to cultivate and exploit the sanctuary in an unsustainable manner. However, to save the situation, organizations such as NEAZDP AND HNWCP initiated some conservation measures to maintain socioeconomic and ecological functions of the sanctuary, and also to promote sustainable development for the benefit of humanity. These measures include the establishment of community woodlots, tree planting, Fadama rice cultivation, provision of efficient wood stoves, agro-forestry practice and provision of loan to the people. But most of the measures were constrained by lack of lands funds and people's negative attitude to the conservation measures. In view of this, the study suggests that there is urgent need to intensify campaign and to involve people in the formulation and execution of any policy. During the course of this study farmers confirmed that farming is the only means for their survival.

Table 2: Cultivated crops in the sanctuary their uses and ranking

S/N	Scientific Names	Hausa Name	Uses	Ranking	
				Before	After
1	<i>Pemisetum typhoidae</i>	Gero	F,I,F,d,c,	01	01
2	<i>Oriza sativa</i>	Shinkafa	F,I,F,d	02	04
3	<i>Sorghum bicoloe</i>	Dawa	F,I,Fd,c	03	02
4	<i>Tsiticum aestirum</i>	Alkama	F,I,Fd	04	05
5	<i>Curcubita Spp</i>	Kabewa	F,I	05	06
6	<i>Hibiscus escalantus</i>	Kubewa	F,I	06	07
7	<i>Solanum lycopersicum</i>	Tumatur	F,I	07	08
8	<i>Cowpea</i>	Wake	F,I,Fd	08	03

Source: Field Work, 2008

Key F = Food,
I = Income,
Fd = Fodder,
C = Construction.

The use of wild plants

Table 3 illustrates the use to which wild plants found in the sanctuary are put by the respondents as can be seen on the table most of these wild plants have multiple or more uses. Table 3 also shows the ranking of these wild plants by the respondents. It is clearly seen in the table that there are changes in the ranking

of these plants even though the changes are insignificant. The uses to which these wild plants are put by the respondents include medicinal uses, fuel wood, food, income folder and construction.

Table 3: Wild Plants in the Sanctuary, their Uses and Ranking.

S/N	Scientific Names	Hausa Name	Uses	Ranking	
				Before	After
1	<i>Azadirichta indica</i>	Maina	M,FW	05	04
2	<i>Hypenia thebaica</i>	Goruba/kaba	F,I,FW,C	03	02
3	<i>Tamarindus indica</i>	Tsamiya	F,I,FW	01	03
4	<i>Adausania digitata</i>	Kuka	F,I,M,FW	02	01
5	<i>Balamite aegyptiaca</i>	Aduwa	F,I,M,FW	06	05
6	<i>Ziziphus manritiana</i>	Magarya	F,I,MFW,Fd	07	06
7	<i>Diospyros merpliforms</i>	Kanya	F,I,M,FW	04	08
8	<i>Vitex domiana</i>	Dinya	F,I,M,FM	09	07
9	<i>Leptodonia parotechnica</i>	Yadiya	F,I,Fd	08	09
10	<i>Pelliosigma Spp</i>	Kalgo	M,Fw,Fd	11	11
11	<i>Calotrophis procero</i>	Tumfafiya	M,Fw,Fd	16	16
12	<i>Acacia albida</i>	Gawo	I,Fw,Fd	10	10
13	<i>Acacia nitotica</i>	Bagaruwa	I,Fw,M	13	15
14	<i>Acacia senegal</i>	Dakwara	I,m,Fw	14	12
15	<i>Acacia sieberiana</i>	Farar Kaya	I,m,Fw,C	15	13
16	<i>Kyaya senegalansis</i>	Madachi	I,m,Fw,c	12	14

Source: Field Work, 2008

Keys: F = Food, C = construction, I = Income, M = medicinal use, Fw = Fuel wood, Fd = Fodder

Grazing thrives in the Dagona Waterfowl sanctuary due to the availability of green pastures which facilitate animal grazing for the greater part of the year. The Fulani nomads and livestock owners in Dagona village graze their animals in the sanctuary. The rate at which grasses are being exploited through animal grazing if allowed to continue without proper conservation measures would lead to environmental degradation. Some people are directly involved in clearance and selling of grasses for both wet and dry seasons as their source of income. Their activities are continuous and not properly regulated as a result of the level of poverty in the area and this is of course another threat to the resources.

In order to meet the sustainable demand for animal food requirement, the Yobe State Ministries of Environment, Livestock and Fisheries, YOSADP, NEAZDP and HNWCP have initiated many conservation measures to at least minimize the unsustainable utilization of the grasses. Notable among the measures are demarcation of grazing field, demarcation/construction of artificial earth dam, and by giving loan to the people to enable them engage in sustainable animal rearing. The Fulani nomads accused the officials of the sanctuary of extorting money (as fine) from them. By this act the sanctuary is doing more harm than good.

CONCLUSION

The Study concludes that it is through their occupations (activities) that the environment offered them with all the basic needs, food, water, shelter, clothing, fuel and drugs. These gifts of nature are so delicate and exhaustible thus, making the relationship between man and the environment so sensitive. In the process of development, man tempers with the environment and the resources both renewable and non-renewable. Over cultivation, overgrazing and deforestation are major human activities that degrade the natural quality and quantity of the environment and the resources. Poverty as an issue is what forced them not to accept the conservation measure in totality. Certainly, degrading the natural quality of the resources is an open invitation to environmental problems such as drought and desertification, soil erosion, flooding, wildlife extinction, poverty and diseases.

RECOMMENDATIONS

- **People's participation in policy formation and execution:** Any conservation policy formulated should be people oriented so as to carry people along. The people are the beneficiaries, they are in a better position to contribute and appropriate the conservation activities. Such policy must reflect their social, economic and cultural status.
- **Environmental Education:** Sustained campaign about the danger of unsustainable utilization of the resources through various human activities. The people at the rural level should be educated on how to protect, utilize and maintain the quality and quantity

of the environmental resources without jeopardizing their livelihoods.

- **Funding:** The Dagona Waterfowl Sanctuary management and other relevant ministries and organizations should be given enough money that would be judiciously used to facilitate their operation smoothly.
- **Acquisition of skill:** The people should be encouraged, through capacity building to acquire technical know-how, and skill that would enable them to be involved in decision making and implementation management of the sanctuary.

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