

A Survey of the Ecosystem Services Rendered to the Surrounding Communities of Hadejia-Nguru Wetlands

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Abstract

Wetlands are terrestrial or semi-terrestrial ecosystems attributed with low drainage quality, they are characterized by slow waters or seldom standing water body filled with soil, they can be categorized as bog, marsh, or swamp based on the floral habitat and associated soil components. Resources attributed to the wetlands in Nigeria are highly valuable; they contain both fauna and flora species that are beneficial to man. This study was aimed at determining the social and economic contributions of wildlife resources to the inhabitants of Hadejia-Nguru wetland. Questionnaires and direct observations were used in data collection using 100 respondents. Descriptive statistics was used to analyze the data collected. The study found that most of the inhabitants of the wetlands depended on the available resources, with 94% of the respondents stating that they benefited (food provision, income generation) directly from the wetlands. It is therefore recommended that sustainable use of these resources be implored to meet both present and future generations.

Keywords: Ecosystem services, Hadejia-Nguru wetlands, Sustainable development, Wildlife resources

INTRODUCTION

Wetlands represent one of the most productive systems of the terrestrial landscape (Ramsar, 1994). Wetlands are found in every continent except the Antarctica and represent 4-6% of the earth's surface (Mitsch & Gooselink, 1986). Wetlands have undergone a spectacular reversal in image as a consequence of scientific research during the twentieth century. Wetlands are estimated to occupy around 8.6 million km² (6.4 %) of the earth's land surface (Mironga, 2006). Wetlands provide goods and services to human considered valuable, these include fisheries, wildlife, mining, energy, and recreation (Kamukala & Crafter, 1993).

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Wetlands play a critical role in global climate change regulation by serving as carbon sinks. For example, the global peat lands can store between 400 and 500 gigatons (Gt) of carbon (Paul *et al.*, 2009). Wetlands play an instrumental role by serving as a transition zone of varying water regimes, and act as natural filters that can improve water quality through reducing nutrients loadings, water aquifer, thus, often called “*the kidneys of the catchment*”, and as “*biological supermarkets*” because of their rich food webs and biodiversity (Barbier *et al.*, 1997; Marwa *et al.*, 2013).

The lack of compliance to protected wetland laws has made it attractive as a means of survival and economic opportunity for communities living around wetlands especially those with limited options (Ellis, 1999). The natural resources of Nigerian Wetlands are a major source of livelihood to wetland inhabitants, while the nutrient rich soils are excellent for agricultural purposes (Nicholas *et al.*, 2009). Rural populations in Nigeria are very dependent on wetlands as an exclusive source of survival in areas where they occur and the values of such wetlands are immeasurable (Ellis, 1999).

The socioeconomic importance attributed to the wetlands area is greatly derived from the wildlife resources in the floodplain. The Hadejia-Nguru Wetlands(HNWs) wetland also has great importance in terms of economic values for the inhabitants. Some of the resources of the wetlands include birds, turtle, fish, amphibians and mammals; these have improved the wetland as a well-functioning ecosystem that requires great attention (Elegbede, 2014).

Fishermen and farmers in the HNWs represent about 75% of the indigenous community population (Birdlife International, 2015), and the wetlands represents their entire source of livelihoods through farming and fishing activities. Farming in particular accounts for about 25%, major crops grown include rice, maize, sesame, sorghum, wheat, millet, and some vegetables such as tomato, pepper, onions, and carrot (Ogunkoya & Dami, 2007; Kaugama & Ahmed, 2014; Birdlife International, 2015). The aim of this study was to assess the social and economic benefits of wildlife resources to the population around the Hadejia-Nguru wetland.

MATERIALS AND METHOD

The study area

The Hadejia-Nguru wetlands is located between latitudes 12°10'N and 13°0'N and longitude 10°15'E and 11°30'E. HNWs lie within the semi-arid region of Nigeria. The wetlands cover an area of about 350,000 ha and altitude of 152-305m (Birdlife international, 2015).

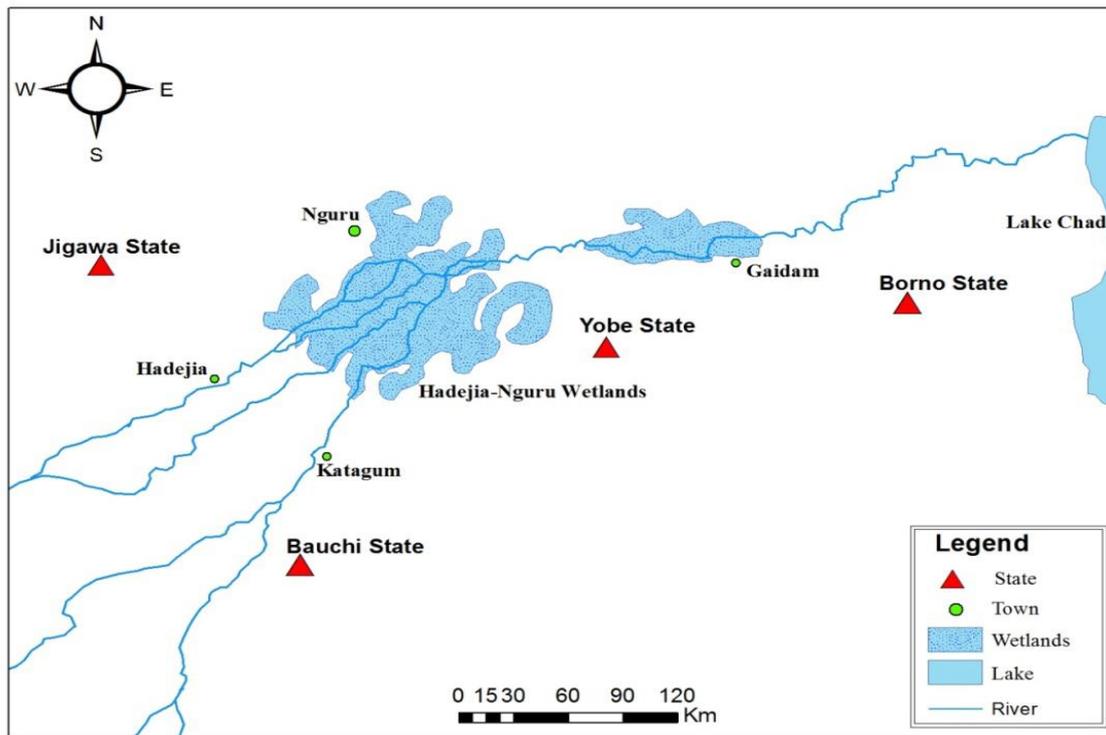


Figure1: Map of the study area

Source: (Eaton & Sarch, 1997)

The topography of the area is mostly low lying flat surfaces on the north-eastern side and sparse local relief in the southern and western parts. Rainfall pattern in the HNWs has not been stable over the years, but in most cases starts from June and falls through September. The Vegetation of HNWs is mainly Sudan Savanna, with transitional northern Guinea Savanna and Sahel Savanna in the Southern and Northern limits respectively. The climate of the wetland is characterized by two distinct seasons; wet (May-September) and dry season (October-April), rainfall is between 500- 600mm, with mean minimum temperature of 12°C during the month of December to January, to a maximum of 40°C during the month of April (Ogunkoya & Dami, 2007). The ecosystem comprises permanent lakes and seasonally flooded pools connected by a network of channels. The ecosystem is an important site for biodiversity, especially migratory water birds from Palearctic regions.

Hausa, Kanuri and Fulani are the most dominant tribes in the wetlands, which include the farmers, herders and fishermen who entirely depend on the ecosystem for their livelihoods (Kaugama & Ahmed, 2014; Birdlife International, 2015).

The wetlands provide essential income and nutritional benefits in the form of agriculture, grazing resources, non-timber forest products, fuel wood and fishing (Ramsar, 1996). The Hadejia-Nguru Wetlands is bordered by three states of Bauchi, Jigawa and Yobe (Blench, 2013).

Sampling techniques

Questionnaires were used to obtain information needed for the research, this was supplemented with secondary data. A stratified random sampling technique was used to select respondents for this study. The first stage involved random selection of three (3) local government areas, two from Yobe State and one from Jigawa, The criteria for the selection

were based on the fact that the three LGAs were among the wetland areas and are known for intensive activities. These LGAs were Guri, Nguru and Karasuwa. In the second stage 5 communities were randomly selected from the LGAs namely; DabarMagini and Adiani from Guri LGA, Garbi-BomboriandBulabulin from Nguru LGA and Wachakal from Karasuwa LGA. A total of 100 respondents comprising of 20% farmers, 20% fishermen, 20% herdsman, 20% business men and 20% for other inhabitants of the wetlands were used. All the data collected for this research were analyzed using simple descriptive statistics.

RESULTS AND DISCUSSION

Socio-economic characteristics of the respondents

The socio-economic characteristic of the respondent examined by the study are presented below in Table 1. Majority of the respondents were males, indicating that the occupational activities in the study area is dominated by male which signifies that culture played a significant role in the area were as women were not allowed farming by themselves and were not allowed to be interviewed by enumerators as it is believed that when women were allowed to farm, there would be no success or bumper harvest in terms of crop production (Bashir, 2015). The women are only engaged in businesses (such as pot making, harvesting and selling potash, selling of building materials, selling of herbal medicines, weaving of local mats and hand fans made of grass, as well as fire wood selling).

Table 1: The socio-economic characteristics of the respondent

Variables	Frequency	Percent %
Gender		
Male	80	80.0
Female	20	20.0
Age		
20-30	20	20.0
31-40	37	37.0
41-50	25	25.0
>50	18	18.0
Education		
None	6	6.0
Primary Education	12	12.0
Secondary Education	52	52.0
Tertiary Education	11	11.0
Qur'an Education	16	16.0
Household Head		
Man	94	94.0
Woman	6	6.0
Household Size		
1-3	3	3.0
4-6	18	18.0
7-10	29	29.0
>10	48	48.0
None	2	2.0
Occupation		
Business men	20	20.0
Employees	20	20.0
Farmers	20	20.0
Fishermen	20	20.0
Herdsman	20	20.0
Total	100	100.0

Source: Field Survey (2017)

About 82% of the Respondents were within the age group of 20-50 years, depicting that more than 80% of the total sample size have high chance of fertility and to have many children as a consequence in the long run, unless corrective measures will be taken, contribute to high population growth leading to resources depletion. These findings are also consistent with those of Nwankoala (2012) who reported that most active farmers, herdsman and fishermen fall within the age group of 31- 50 years.

Furthermore, about 50% of the respondents had no formal education. Akpa (2007) &Obasi (1991) found that the level of education attained by a farmer not only increase his/her farm productivity but also enhances ability to utilize effectively and efficiently whatever resources exist in the area.

In terms of household size according to the respondents, 48% of the wetland users had greater than 10 members per household. Households with 3 and below were only 3%.This result shows that majority of the wetland users have large households indicating that most of the men married more than two wives in order to have more hands in carrying out various activities in the wetland. Alternatively, they could be family members, relatives or other people living within the household for an extended period of time, either way, they still leave their prints on the wetland.

The values of wetland resources

The results in Figure 2 below showed that the inhabitants of HNWs benefit from the values provided by the wetland as shown by their various occupations. Wetlands are thought of as “biological supermarkets” so they produce great quantities of food that attract many animal species. This finding is in agreement with the study conducted by Idris (2008), which revealed that the Hadejia-Nguru Wetlands community benefit from various activities that surround the wetlands, such as income generations and provision of food, from the different activities such as agriculture, land grazing, wood for domestic fueling, other wood products, tourism and mechanisms for protection against drought. According to Collings (2009), this value can be determined from the summation of a system’s use values and non-use values. Use values include direct use such as harvesting of resources, indirect or ecological function values such as flood control, and option value such as future drugs. Non-use values include existence values, which place importance based purely on the presence of a system, and bequest value.

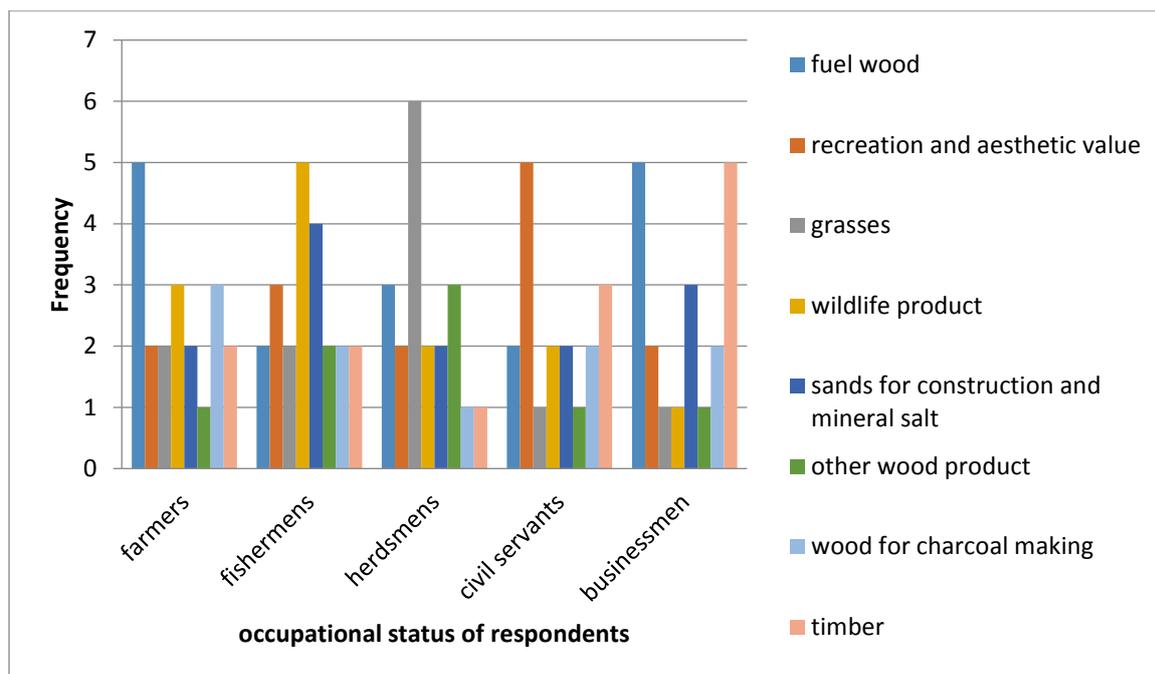


Figure 2: Resources used by various groups in the study Area, 2017.

More than 70% of the respondent lived in this place for more than 15years. The results in Table 2 agrees with the finding of Frankenberg and McKesson (1998) who found that livelihood is the sustainable access to resources to meet basic needs including adequate access to food, portable water, educational opportunities, housing and social integration. While Babuloet *al.*, (2008) regarded livelihood assets as comprising both human and non-human resources upon which livelihood are built and to which people need access.

Table 2: Factors that influence people to settle in the Wetlands

	Frequency	Percent %
Better Living Environment	22	22.0
Cultural Benefits	11	11.0
Easy access to resources	24	24.0
Presence of land for settlement and livelihood	28	28.0
Presence of wildlife	15	15.0
Total	100	100.0

Source: Field Survey (2017)

Economic activities in the wetland

As part of the socio economic values that the inhabitants do benefit, this research found out that hunting and birding are the major recreational activities that the inhabitants engage in and had the highest percentage (52%), while swimming and canoeing, as well as camping and hiking had the lowest values (9%). The wetlands favour recreational activities for people and even researchers, who go to the area in pursuit of fun, sight-seeing and collection of data for research purposes. This finding is in line with Essien (2011) who reported that, recreational activities and tourism is quite an evolving phenomenon in the area and it is anticipated that with the sustainable development and management of wetlands in the area, recreation and tourism will come to stay

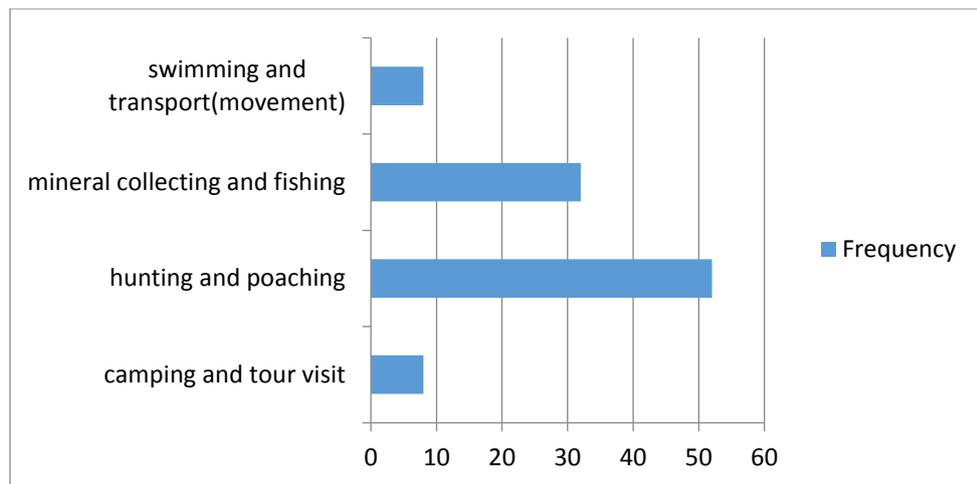


Figure 3: Economic activities in the wetland

CONCLUSION AND RECOMMENDATIONS

Results from this study provide evidence of the socio-economic benefits derived from wetlands resources. Hadejia-Nguru wetlands provide provisioning, regulatory, supportive and cultural services to the inhabitants of the study area. The inhabitants reap more benefits from the provisioning services (i.e. food, raw material, water, cultivation, fish nurseries) which have 94% and significantly contributing to socio-economic livelihoods for the study area. The opportunities or benefits that the people obtain from this resource may become a threat in the long run unless they use it in a sustainable manner.

Massive awareness campaigns should be carried out to enlighten people on the benefits of natural resources and the urgent need to sustainably use them. Furthermore, creation of agribusiness enterprises (diversifying sources of income) and increasing agricultural productivity by linking the economic and social benefits of wetlands to its conservation for its protection is needed.

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