Characteristics and Socio Economic Activities of Local Communities Living Along the Nguru Wetlands, Yobe State, Nigeria

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Abstract:
The study was conducted to assess the characteristics and socio economic activities of the local communities living along Nguru wetlands of Yobe state, Nigeria. Three towns situated along the wetlands namely Nguru, Kakori and Dogon Kuka all in Nguru Local Government Area of Yobe state, Nigeria were selected for the study. A total of 197 respondents from among the local communities participated in the study. Descriptive Survey method of research involving mixed methods was employed. Data collected was analyzed in SPSS using Descriptive Statistics. The study revealed that all of the respondents (100%) were Nigerian citizens with majority of whom (48.22%) lacking the basic western education. Male constituted 85.78% while women were only 14.21% of the study population. All respondents were found to be muslim faithful. Household sizes were relatively big (57.36%) and considerable number of the respondents was married young adults within the range of 25 – 34 years. It was also discovered that majority of the respondents (30.46%) belong to the Kanuri tribe while Hausa, Fulani, Kare Kare and Bade tribes were represented as (26.40%), (26.90%), (8.12%) and (8.12%) respectively. Yobe state had the largest number of its indigenes (55.84%) living along the wetlands followed by Jigawa and Bauchi states having (29.95%) and (9.64%) respectively. Very good number of the respondents was engaged in fishing (26.40%) followed by crop farming (19.29%). Others were engaged in livestock farming, irrigation, transportation and hunting represented by (21.83%), (5.58%), (3.05%), and (1.52%) respectively while those engaged in trading, potash collection and Typha clearance were represented by (9.14%), (4.06%) and (3.55%) respectively. No tourists guide was found. Crops grown along the Nguru wetlands are maize (Zea mays) which is the most commonly grown crop followed by rice (Oryza sativa) and sorghum (Sorghum bicolor). Many farmers also grow beniseeds or seasame (Sesamum indicum), cassava (Manihot esculenta), corn (Zea mays) and beans...
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Livestock commonly reared are cows (Bos taurus), goats (Capra aegagrus hircus) and sheep (Ovis aries). However, all economic activities along the wetlands are seriously threatened by Typha invasion of the wetlands hence, government and other NGOs should employ effective control measures against this invasion in order to resuscitate the gradually perishing economic value of the Nguru wetlands.

Key Words: Characteristics, local communities, Nguru wetlands, socio economic activities.

Introduction:

While some view wetlands as wasted land, in reality they are one of the most valuable resources. Indeed, its importance to the protection of our lakes and streams cannot be overstated. For this reason, many wetlands, particularly the larger ones and those bordering the Great Lakes are protected by state and federal laws. Apart from the most well-known benefits of wetlands to man which is the provision of avenue for fishing, farming, irrigation and provision of numerous recreational opportunities, other benefits derived from wetlands include helping to control flooding and storm water, protecting water quality by filtering and breaking down sediments, nutrients, and toxins and then slowly releasing the water to recharge the ground water, providing habitat for many different species of wildlife including fish, insects etc. Other benefits include, treating pollution by serving as a biological and chemical oxidation basin, controlling erosion by serving as a sedimentation area and filtering basin for slat and organic matter as well as providing (www.mywatersheds.org).

The Nguru wetlands located in the north eastern part of Nigeria particularly in Yobe state, is a part of the Hedejia-Nguru Wetlands (HNWs) located in an area in the southern edge of the Sahel Savanna in north eastern Nigeria comprising of permanent lakes and seasonally flooded pool connected by a network of channels.(Ringim, et. al., 2015). The wetland complex is formed by the Hedejia –Jama’a are Rivers which drain into Lake Chad. The wetlands cover an area of about 3,500 km² (Birdlife international, 2015). Besides, the wetland supports at least 250 species of flowering plants, over 136 types of aquatic flora and fauna, more than 13 species of fishes and 378 species of birds (Oduntan et. al., 2010). About 1.5 million people depend on the wetlands ecosystem for their livelihood in the form of agriculture, grazing resources, non-timber forest resources, fuel wood and fishing. It is one of the sites declared as Ramsar sites in Nigeria. The wetlands serve as a major source of fish, supplying approximately 6% of Nigeria’s inland fish catch with a market value of nearly US $300s,000 per annum (Birdlife International, 2015). It was the first wetland named as a Ramsar site. The area is dominated by Hausa, Fulani, Kanuri, and Bade ethnic groups with population capacity of 1million people; these people depend on the wetland for water supply and other daily activities. About 1.5 million people depend on the wetlands ecosystem for their livelihood in the form of agriculture, grazing resources, non-timber forest resources, fuel wood and fishing. Many of the inhabitants of the area emigrated around the 60s at the time of drought. 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 and Dami, 2007; Kaugama and Ahmed, 2014; Birdlife international, 2015). The wetland area has abundant agricultural resources worth about € 26, 982, 651.60 and the region serves as a centre point of cattle trade worth of 250,000 cattle. (Elegbede, et. al., 2014). In dry seasons, many nomadic herdsmen mostly Fulanis inhabit the area with large number of animals especially cattle. According to Kaugama and Ahmed (2014), Hausa, Kanuri and Fulani are the most dominant tribes in the wetlands with an estimated population of about 1.5 million Including farmers, herdsmen and fishermen.
who entirely depend on the ecosystem for their livelihoods.

**Statement of The Problem:**

Wherever they exist around the world, shores of wetlands are usually inhabited by mostly poor rural communities whose livelihoods majorly depend on the wetlands resources such as access to drinking water, crop farming, fishing, irrigation, livestock farming and so on. For example, The Niger Delta is one of the largest wetlands in the world and currently has three sites listed as Ramsar Wetlands of International Importance. The region is home to nearly 30 million people, 60 percent depend directly on the services provided by the environment – such as fish and clean drinking water– for their well-being. The Abobiri, Obia-yagha and Opume communities in the Niger Delta have changed the way they manage their wetland environment. 58 community member-groups provided with access to micro-credits have stopped wetland-detrimental livelihood practices (mainly mangrove cutting) and switched to wetland-friendly livelihood practices such as fish, periwinkle, plantation and poultry farming. ([www.wetlands.org/case](http://www.wetlands.org/case)).

Similarly, other studies have been conducted which described to some level the characteristics of communities living along the entire Hadejia Nguru Wetlands (HNWs) such as that of Birdlife International (2015) which revealed that the Hadejia-Nguru Wetlands is an area dominated by Hausa, Fulani, Kanuri, and Bade ethnic groups with population capacity of 1million people; these people depend on the wetland for water supply and other daily activities. About 1.5 million people depend on the wetlands ecosystem for their livelihood in the form of agriculture, grazing resources, non-timber forest resources, fuel wood and fishing. Many of the inhabitants of the area emigrated around the 60s at the time of drought. Fishermen and farmers in the HNWs represent about 75% of the indigenous community population Birdlife International (2015).

However, all the above studies described the characteristics of communities living along the entire HNWs which cut across three different Nigerian states of Jigawa, Bauchi and Yobe. In view of this, this study was aimed to study and assess the characteristics as well as socio economic activities peculiar to those communities living along the Nguru wetlands in Nguru Local Government Area of Yobe state only.

**Materials and Methods:**

The study was conducted between the months of July – August 2017 in three settlements of Nguru, Kakori and Dogon Kuka all in Nguru Local Government Area of Yobe state Nigeria. Descriptive Survey method of research involving mixed methods was used. The study targeted a sample size of 197 respondents from among the local communities. Researcher made closed ended questionnaire was used to collect quantitative data while Structured Interview Guide was also used to collect some qualitative data. Quantitative data was analyzed using Descriptive Statistics while qualitative data was analyzed using Thematic method. Respondents were sampled by Convenient and Snowball sampling techniques and were met at different farmlands, irrigation fields, fishing sites and grazing fields.

**Study Area:**

The Nguru Wetlands found in Yobe State Nigeria is a segment of the Hadejia – Nguru Wetlands which lies along a central coordinates of Longitude 10° 33’ East and Latitude 12° 39’ North, with altitude of 152 – 305m. It is an extensive area of floodplain located in the north-eastern Sudano-Sahelian zone of Nigeria, covering an area of approximately 3,500 square kilometer (FAO, 2009). It has an annual rainfall which ranges between 200 – 600 mm, with a rainy season that lasts three to four months, confined to the period late May – September. It comprises of permanent lakes and seasonally flooded pools connected by a network of channels (Birdlife international,2012).
Results Analysis:

Demographic characteristics of the local communities:

Frequency and Percentage distribution tables were used to analyze data on demographic characteristics of the respondents in terms of gender, age, marital status, education level, and household size as indicated in the table below.

TABLE 1: Demographic characteristics of the respondents

| Gender   | Frequency | Percent (%) |
|----------|-----------|-------------|
| Male     | 169       | 85.78       |
| Female   | 28        | 14.21       |
| Total    | 197       | 100.0       |

| Age      | Frequency | Percent (%) |
|----------|-----------|-------------|
| 15-24    | 18        | 9.14        |
| 25-34    | 89        | 45.18       |
| Total    | 197       | 100.0       |

| Marital status | Frequency | Percent (%) |
|----------------|-----------|-------------|
| Single         | 58        | 29.44       |
| Married        | 126       | 63.96       |
| Divorced       | 13        | 6.60        |
| Total          | 197       | 100.0       |

| Education    | Frequency | Percent (%) |
|--------------|-----------|-------------|
| Arabic       | 95        | 48.22       |
| Primary      | 63        | 31.98       |
| Secondary    | 29        | 14.72       |
| Diploma      | 9         | 4.57        |
| Degree       | 1         | 0.51        |
| Total        | 197       | 100.0       |
The results presented in the table above revealed that 85.78% of the respondents were male while females were only represented by 14.21%. The majority (45.18%) of them were within the age group of 25-34 years while the least represented were those within the age group of more than 65 years (1.52%). Similarly, the table also revealed that the majority (63.96%) of the respondents was married and only 6.60% were divorced with 29.44% still being single. Married men seem to be the dominant group in the study area. The study did also discover that a very good number of the respondents (48.22%) possessed only Arabic education and lack the basic western education; 5.08% had post-secondary school certificates while 46.7% had primary or secondary qualifications. Not only that, the typical communal lifestyle of the African tradition has been demonstrated in this study where the majority 57.36% of the households had big household sizes with family members ranging from 6-15.

Cultural characteristics of the local communities

| Household size | Frequency | Percent |
|----------------|-----------|---------|
| 1-5            | 55        | 27.92   |
| 6-10           | 86        | 43.65   |
| 11-15          | 27        | 13.71   |
| 16-20          | 18        | 9.14    |
| 21 and above   | 11        | 5.58    |
| **Total**      | **197**   | **100.0** |


| State of Origin | Frequency | Percent |
|-----------------|-----------|---------|
| Yobe State      | 110       | 55.84   |
| Jigawa          | 59        | 29.95   |
| Bauchi          | 19        | 9.64    |
| Others          | 9         | 4.57    |
| **Total**       | **197**   | **100.0** |

| Tribe            | Frequency | Percent |
|------------------|-----------|---------|
| Kanuri           | 60        | 30.46   |
| Huasa            | 52        | 26.40   |
| Kare Kare        | 16        | 8.12    |
| Fulani           | 53        | 26.90   |
| Bade             | 16        | 8.12    |
| **Total**        | **197**   | **100.0** |

| Religion        | Frequency | Percent |
|-----------------|-----------|---------|
| Islam           | 197       | 100.0   |
| Other           | 00        | 00.0    |
| **Total**       | **197**   | **100.0** |

The findings presented in the table above revealed that more than three quarter of the respondents (83.6%) were residents of the three settlements where the study was conducted (Nguru, Kakori and Dogon Kuka) all along the Nguru wetlands and all of them (100%) were Nigerian citizens. Similarly, the majority of them (55.84%) were indigenes of Yobe State. Other states also represented in the communities were Jigawa and Bauchi states represented by 29.95% and 9.64% respectively. Other states not mentioned were represented by 4.57%. Besides, the majority of the respondents (30.46%) belong to the Kanuri tribe which is the most dominant tribe in Yobe state while some other tribes present in the communities were Hausa, Kare Kare, Fulani and Bade represented by 26.4%, 8.12%, 26.9% and 8.12% respectively. In addition, all the
Economic activities of the local communities

| Economic activities of the local people | Frequency | Percent |
|----------------------------------------|-----------|---------|
| Crop farming                           | 38        | 19.29   |
| Livestock farming                      | 43        | 21.83   |
| Fishing                                | 52        | 26.40   |
| Hunting                                | 3         | 1.52    |
| Transportation                         | 6         | 3.05    |
| Irrigation                             | 11        | 5.58    |
| Tourists guiding                       | 0         | 0       |
| Potash collection                      | 8         | 4.06    |
| Trading                                | 18        | 9.14    |
| *Typha* clearance                      | 7         | 3.55    |
| **Total**                              | **197**   | **100.0** |

Economic activities of communities living along the Nguru wetlands were found to be relatively diverse and were measured using type of economic activity engaged such as fishing and farming, farm size, types of crops grown, animal species reared, number of animals owned, type of means of transportation used, fishing seasons engaged, type of hunting engaged and so on. As shown in the table above, fishing was found to be the most dominant economic activity as the majority of the respondents (26.40%) were fishermen while the second dominant economic activity among the local communities was crop farming represented by 19.29%. Other economic activities engaged by the local communities were livestock farming 21.83%, hunting 1.52%, transportation 5.58%, irrigation 8.63%, potash collection 4.06%, trading 9.14% and *Typha* clearance 3.55%. No respondent was found to be a tourists’ guide however, tourism was once a booming recreational activity along the wetlands.

Types of crops commonly grown by the crop farmers:

Most of the crops grown along the wetlands were the common stable food crops in the area as well as in many parts of northern Nigeria. The results on types of crops grown along the wetlands revealed that the most commonly grown crop was maize (*Zea mays*) grown by 23.7% of the crop farmers who participated in the study followed by rice (*Oryza sativa*) and sorghum (*Sorghum bicolor*) which were grown by 15.7% each of the respondents. Besides, a good number of the farmers (15.7%) also grow beniseeds or seasame (*Sesamum indicum*) while farmers growing cassava (*Manihot esculenta*), corn (*Zea mays*) and beans (*Phaseolus vulgaris*) were represented by 10.5% each. However, it should be noted that a good number of the crop farmers stated that more often they grow different types of crops on the same farmland such as maize and beans, sorghum and groundnut etc. The mostly grown crops, maize, sorghum and rice were culturally the dominant food crops in the area. The figure below shows the farm sizes of the crop farmers, the types of crops they grow as well as the type of farming they engage in.

Type of farming engaged by the crop farmers:

Although the majority of the crop farmers (60.5%) claimed to be sustenance farmers mainly engaged in farming to feed their families, a good percentage of them (39.5%) stated that they were commercial farmers engaged in commercial farming. These commercial farmers mostly owned
more than 3 hectares of farmlands growing mainly cereal crops commonly used as stable food in the area such as maize, sorghum, rice as well as sesame. The figure below shows the farm sizes owned by the different crop farmers, types of crops grown as well as the type of farming engaged by them.

![Diagram showing farm sizes, types of crops grown, and types of farming](image)

**Figure 1: Farm sizes, types of crops grown and types of farming engaged**

**Types of animal species mostly reared by the livestock farmers:**

With respect to the types of animal species reared, the results revealed that the majority of the respondents (48.83%) rear cows (*Bos taurus*) only, followed by those rearing mixed animals (23.26%) mainly comprising of cattle and sheep. Those rearing only goats (*Capra aegagrus hircus*) were represented by 11.63% while sheep (*Ovis aries*) rearers constituted 16.28%. Possession of big herds of cattle is usually considered as a symbol of wealth and power in the area. Cattle are most commonly reared by the nomadic Fulanis although other ethnic groups also do keep cattle.

**Number of animal owned by the livestock farmers:**

Meanwhile, in terms of number of animals owned, the study results also revealed that livestock farmers along the wetlands did vary. The results showed that the majority of the respondents (46.51%) own number of animals ranging between 41-50 followed by those who own 31-40 animals (20.93%). Livestock farmers having more than 50 animals constituted 16.3% while those who own 10-20 and 21-30 animals were represented by 4.7% and 11.63% respectively. The dominance of the respondents with 41-50 animals implies that most of these local livestock farmers are rich and are economically sound. It is worthy to note that most of the times herdsmen in the area do not go for grazing with all their animals at once and are nomadic in nature. The figure below shows the types of animals reared by the livestock farmers as well as the number of animals they own.
Seasons of fishing engaged by the fishermen:

Although the study results indicated that fishing was the most dominant economic activity along the wetlands (26.40%), it was also discovered that not all the fishermen fish at the same but engage in different fishing seasons. Due to some reasons, the majority of the fishermen (50.0%) engage in active fishing only during the rainy or wet season while those engaging in all year round and dry season fishing activities constituted 34.6% and 15.4% respectively. More than 50% of the fishermen belong to the Hausa tribe although a good number of them also belonged to the Bade and Kare Kare tribes. Fishing activities along the wetlands are usually at their peak during the wet season when the wetlands are fully flooded and fish abundance and diversity are expectedly high.

Types of means of transportation used by the transporters:

Possibly, because of the booming market along the wetlands, commercial transportation was also practiced by some of the local community people conveying different goods and commodities using different means of transportation. In respect to this, the study results showed that the majority of the respondents who engaged in commercial transportation activities (36.36%) used canoes as the means of transportation while 27.27% use vehicles such as trucks and pick up vans. Another 18.18% of them use carts/wheel barrows as commercial means of transportation while those using bikes or motorcycles popularly known as Achaba in the area constituted 18.18%. Canoes were the most convenient means of transportation along the wetlands to access remote fishing sites and farmlands.

Types of animals hunted and seasons of hunting engaged by the hunters:

Some years back when Typha invasion of the Nguru wetlands was relatively not as bad as it is now, it was learnt that many types of animals were hunted. Results obtained from the study revealed that 66.7% of the hunters who participated in the study stated that they now hunt only birds while 33.3% of them claimed to be animal hunters. Besides, according to 78.64% of them, few years back before invasion of the wetlands by Typha hunters did hunt all year round but now engage in active hunting only occasionally. The figure below shows the season of fishing engaged by the fishermen, types of means of transport used and types of animals hunted.
Figure 3: Seasons of fishing, types of transport means and types of animals hunted

Type of trading engaged by the traders:
At the wetlands where considerable numbers of the people engage in farming, fishing and so on, some residents of the communities engage in trading of these commodities as well as other goods. In line with this, results of the study revealed that trading was one of the many economic activities practiced along the Nguru wetlands and a good number of the local people (9.14%) claimed to be engaged in different types of trading. About 42.90% of them engage in buying and selling of fish which was the most abundant commodity along the wetlands. Most of the fish traded was mainly transported to other towns and cities or even to neighboring countries like Niger and Tchad republics. Those involved in the trading of farm produce mainly rice, corn, sorghum, sesame and so on constituted 34.88%. Similarly, another 22.22% were engaged in the selling of daily provisions such as soaps, bread, foodstuff etc. and products from irrigation such as fruits and vegetables. The figure below shows the different types of traders operating in the area.

Figure 4: Types of trading
Potash collection:

During dry season when considerable portion of the wetland dries up, some of the local people collect potash from the wetlands mostly in powder form for sale in the markets, an act they consider as their source of livelihood. Thus, 4.06% of the respondents claimed to depend on potash collection and selling as the economic activity that earns them good amount of cash for a living.

Typha clearance:

Ironically, the menace of Typha proliferation and invasion of the Nguru wetlands which threaten the survival of many economic activities along the wetlands, to some youth it was a blessing. This study discovered that considerable number of the youth (3.55%) mainly residents of the area engage in Typha clearance as a source of livelihood. Services of these youth were hired by many crop farmers and fishermen to clear biomass of Typha from their farmlands and fishing sites for financial returns. According to them, they were being paid good amount of money on which they survive.

Discussions:

Demographic characteristics of the local communities:

In fact, all respondents involved in this study were met and selected at different places where they engage in various economic activities such as farming and fishing; a reason good enough perhaps to explain why the majority of them were found to be male. This could perhaps be attributed to the fact that, culturally, men were mostly involved in strenuous economic activities such as farming and fishing. Usually, men leave their spouses confined to houses responsible only for household activities like cooking, fire wood and water fetching. Besides, majority of the men were young married adults within the age group of 25-34 years. It is the tradition of the area that boys and girls were married at very tender ages of 13 and 18 for girls and boys respectively. Dominance of youth along the wetlands implies that it is the young adults who actually engage in various economic activities in the area virtually as a result of the numerous livelihood opportunities offered by the wetlands. According to Elegbede (2014), the Hadejia - Nguru Wetland communities benefit from various activities that surround the wetlands, such as income generation and provision of food, from the different activities such as agriculture, land grazing, wood for domestic fuelling, other wood products and mechanisms for protection against drought. The wetland is considered to have economic value of around 11.7 million USD (Idriss, 2008).

May be due to the strong emphasis given to Islamic knowledge in the area coupled with the lack of basic educational infrastructures such as good schools, the majority of the local people possess only Arabic education but lack the basic western education needed for meaningful development. Even those who claimed to have attended schools did not go beyond secondary schools. Very negligible claimed to have diploma certificates. Another possible reason for this development could be because most of the local communities living along the wetlands were farmers or fishermen; they often don’t send their children to schools rather they tend to take them to farms, irrigation or fishing sites where they help their parents. Most importantly, grazing of animals was mainly done by children aged 12 – 20 among the nomadic Fulani tribes thus, having no time at all to attend schools. In their efforts to promote literacy among the nomadic Fulani tribes, Yobe and Borno state governments inaugurated the Nomadic Education Programme some years back. Besides, the typical African culture where most families have big households was also reflected in the study because the majority of the respondents agreed to have large household sizes of between 6-15 members.

Cultural characteristics of the local communities:

Unlike many other places found in Nigeria bordering other countries, the fact that Nguru Local Government Area does not border any country may
perhaps be the reason why all the local communities engaged in different economic activities along the Nguru wetlands were found to be Nigerian citizens with more than 83% of them being permanent residents in the area. This meant that only few non-residents come from other places within the country to engage in economic activities along the wetlands. Being the state that geographically houses the wetlands studied, majority of the local communities were indigenes of Yobe state a reason good enough to describe why most of the local people were from the Kanuri tribe. Yobe state is a predominantly a Kanuri settlement although many other minor ethnic groups are also found. Unsurprisingly, other states bordering the wetlands including Jigawa and Bauchi states had their indigenes engaging in different economic activities along the wetlands as well. However, other ethnic groups such as Hausa, Bade, Fulani and Kare Kare do also inhabit the shores of Nguru wetlands. This finding agrees with the report by Birdlife International (2015) that the area is dominated mainly by Hausa, Fulani, Kanuri, and Bade ethnic groups with population capacity of 1 million people; these people depend on the wetland for water supply and other daily activities. The Nguru wetland is mostly dominated by Hausa, Fulani, Kanuri, and Bade ethnic groups with population capacity of 1 million people; these people depend on the wetland for water supply and other daily activities. The majority of the local communities engaged in fishing and farming activities. This further confirms the report by Birdlife International (2015) that fishermen and farmers in the HNWs represent about 75% of the indigenous community population. Fishing activity is the most dominant economic activity in the area providing the locals with employment and consequently income generation. Fisheries and aquaculture activities account for 50% in the wetlands representing the main source and livelihoods of the indigenous communities and is carried out throughout the year. Fish farming to the inhabitants of the Hadejia - Nguru wetlands is the next occupation to crop farming (Animals Right in Nigeria, 2010). The dominance of fishing activity in the area could be because it is cheaper with little financial risks than the other occupations and yet more profitable since it does not require huge start up capitals. According to Sabo et al., (2016), it is on record that, fish catches from the Hadejia-Nguru wetlands contributed about 6% of the annual national income of inland fish sales in Nigeria.

Furthermore, the majority of the fishermen along the wetlands were found to be from the Hausa tribe and not all of them do fish at the same time. Half of the fishermen (50%) claim to fish only during the wet season when the wetland is fully flooded and fish abundance and diversity expectedly tend to be high while 34.6% of them fish all year round. Only 15.4% of the fishermen claim to fish during dry seasons. However, the fishermen complained of drastic fall in the abundance and diversity of fish as a result of Typha invasion of the wetlands. According to Oduntan et al., (2010), the wetland was known to support at least 250 species of flowering plants, over 136 types of aquatic flora and fauna, more than 13 species of fish and 378 species of birds. According to the respondents, despite the catastrophic invasion of the wetlands by Typha, some species of catfish and tilapia such as Silver catfish locally known as Musko, Heterotis or African arowana known as Bargi and Upside down catfish known as Kurungu are still being fished though in little numbers. Basically, invasion of the wetlands by Typha makes the use of modern methods of fish catching difficult as a result of...
which traditional methods of fish farming which mainly involves the use of canoes are employed which account for a small proportion of the fish population thereby fulfilling the aim of conservation in a natural way (Animal Rights in Nigeria, 2010).

Perhaps due to the abundance of moisture favourable for farming along the wetlands, crop farming was found to be the second dominant economic activity practiced by the local communities. The majority of the crop farmers as revealed by the study belong to the Kanuri tribe who mostly own only 1 - 2.5 hectares of land. This suggests that they were most likely to be small scale farmers engaged in sustenance farming. Besides, more than half of the crop farmers stated that they were sustenance farmers mostly engaged in farming to feed their families that were mainly big in sizes comprising of 6 – 15 family members. The inability to own large chunks of land in the area could possibly be attributed to the high population density in a small area in addition to the loss of considerable sizes of farm sites to *Typha* invasion. However, a good number of the farmers who mostly owned large farmlands were commercial farmers growing crops mainly for sale. Commonly grown crops along the wetlands include Rice, Sorghum, Maize, Corn, Beniseeds or sesame, Beans, wheat and Cassava. Sesame and cassava were found to be the crops mostly grown by commercial farmers. Cultivation of wheat, maize and vegetables brought local fadama farmers along the Hadejia – Nguru Wetlands (HNWs) an average income of nearly 10,000 Naira per season a decade ago (Sabo et al., 2016). According to Ringim et al., (2015), farmers in Guri village along the HNWs in Jigawa state could harvest 200 bags of rice in a 10 hectares farmland before the emergence of *Typha*. Although the majority of the farmers claim to farm all year round, a good number of them stated that they farm only during rainy season when the wetlands are fully flooded. According to the farmers, the future of all farming activities along the wetlands was gloomy due to the threat posed by *Typha* invasion of the wetlands.

Expectedly, due to the abundant pasture available the wetlands, a good number of the local communities mainly those from the Fulani tribe engage in livestock farming mostly rearing cattle and practicing the traditional free range grazing. Although the Fulani herdsman were well known to be nomadic in nature moving from one area to another, majority of them do stay for quite a long time in the area and usually migrate when considerable portions of the wetlands dry up leading to a decrease in pasture while others migrate to the area from other places as well. The ownership of large herd of cattle is seen by many as symbol of pride, power and riches in the area. According to Idriss (2008), in dry seasons, nomadic farmers move to the area for grazing and the environment has the capacity to accommodate about 32,000, 370,000 and 375,000 cattle, goats and sheep. The wetland area has abundant agricultural resources worth 26, 982, 651 million euro and the region serves as a center point of cattle trade worth of 250, 000 cattle (Elegbede et al., 2014). The livestock farmers do not practice any modern form of animal farming such as zero grazing but entirely depend on free range grazing along the shores of the wetlands. Such practices of animal rearing usually expose the animals to parasitic infections such as helminthiasis. However, the unprecedented reduction in grazing fields as a result of *Typha* invasion threatens the future of livestock farming along the wetlands. Many of the herdsmen were found to own big numbers of animals as well. Very few own goats and sheep though some were found to rear mixed species of animals.

Another major economic activity engaged by local communities along the Nguru wetlands was irrigation. According to the farmers, some years back before the invasion of the wetlands by *Typha*, yields from irrigation such as maize and vegetables contributed immensely to the people’s incomes. Besides, irrigation farmers had in the past witnessed increase in irrigation along the wetlands largely as a result of the advent of small petrol-powered pumps upon which many farmers depend for watering their...
irrigation fields. Unfortunately, in recent years, majority of the irrigation sites have been overtaken by the stubborn invasive *Typha* or had dried up completely as a result of the blockage of water channels by *Typha*. Possibly, the ordeal of irrigation farmers along the wetlands could have been exacerbated by the construction of dams at the Hadejia Valley Irrigation project site in Jiagawa state and those constructed for water storage upstream between the period of 1971-1974 (Tiga dam), and in 1992 Challawa Gorge for hydrological power reducing flooding downstream into the HNWs with significant socioeconomic impacts (Thomas and Adams, 1997, Barbier et al., 1997). According to Thomas and Adam (1997), farming activities are severely affected due to the local communities’ reliance on seasonally flooded irrigation system (fadama in Hausa language) after the wet season by the construction of dams at Tiga, Chalawa and at the Hadejia Valley Irrigation sites all along the Hadejia-Nguru wetlands. These dams greatly reduce the free flow of water into most irrigation fields. However, pockets of the local people still manage to practice irrigation producing handful yields of maize, vegetables and fruits. According to Haruna (2006), *Typha* is a serious problem threatening the sustainability of the whole irrigation scheme along the Hadejia - Nguru wetlands. Over 80% of the main canal and other water distributary channels have been overtaken by *Typha* thereby blocking the free flow of water into the irrigation fields.

Transportation, hunting and tourists guiding were also other economic activities engaged by local communities along the Nguru wetlands. Although, according to the respondents, the menace of *Typha* invasion in recent years had badly affected these professions, few people still manage to survive on them. Transportation activities using means such as canoes, vehicles, motorcycles, carts and wheel barrows still serve as sources of livelihoods to few people in the area but generally at the verge of coming to an end. Evidently, canoes are the most important means of transportation along the wetlands because it is the only means that can be used to access many remote fishing and farming sites, however, most of the routes or passages being used have been completely overtaken by *Typha*. According to Haladu and Bello (2014), *Typha* has become a common feature along the Hadejia-Nguru wetlands and a nuisance to the communities. It blocks the passage of canoes used for fishing or access to remote farmlands. Transporters using vehicles along the wetlands have also been left stranded with no job at hand as a result of the invasion. Due to the unprecedented drop in fish catches and crop yields, the transporters have very little to transport as results of which very few of them still maintain the occupation. Years back when things were good, transportation was a very lucrative activity and different means of transportation ranging from buses and Lorries conveyed fish and other crops from the shores of the wetlands to different parts of the country.

Hunting was also one of the lucrative activities engaged by the local communities living along the wetlands as their source of livelihood. Some years back, many species of birds and other animals were hunted along the wetlands but now hunters experience a drastic decrease in the abundance and diversity of animal species hunted possibly as a result of *Typha* invasion of the wetlands. According to the hunters, few numbers of birds such as White stock locally called *Galantoyi*, Double-spurred francolin known as *Fakara*, Ducks known as *Agwagwan ruwa* and *Dinya* are still hunted though they are rear and appear in very small number. Besides, few numbers of other animals were also hunted along the wetlands. Many of the hunters had ventured into other professions.

Yet another economic activity engaged by the local communities along the Nguru wetlands was potash collection. During dry seasons when considerable portion of the wetlands dry up, the local collect huge amounts of potash mostly in powdery form for consumption and commercial purposes. According to Derek and Theresa (1993), at the Hadejia-Nguru Wetlands, potash is traded in large quantities in the
market towns of the Wetlands such as Gashua and Nguru, where it is sold as an industrial raw material first to wholesalers and then to traders from the southern parts of the country. In Adiani, potash is not traded on a commercial basis, but is collected during the dry season by a group of about 50 older women who sell it to other households throughout the year. Most households use potash in small quantities as a food ingredient, a stomach medicine and an appetite stimulant for livestock. According to the local people, potash collection earned them a good amount of money, but lack of efficient transportation system affects them coupled with the fact that the activity was too laborious and tiresome. The majority of those engaged in potash collection were adult women.

Ironically, the menace of *Typha* proliferation and invasion of the Nguru wetlands which threaten the sustenance of many economic activities along the wetlands, to some youth it was a blessing because a good number of the local people mainly young men of about 20 – 35 years of age stated that they earn a living along the wetlands by clearing biomass of *Typha* from people’s farmlands, irrigation sites as well as fishing sites. According to these young men, *Typha* clearance got them good amounts of money on which they survive although the activity was usually at its peak during the rainy seasons when thousands of farmers and fishermen converge at the shores of the wetlands for various economic activities. Besides, some of these men did dry the *Typha* cleared from farmlands for making thatched roofs, as fuel for cooking and as mosquito repellent from animal houses by producing smoke when burnt.

Similarly, some years back, tourists guiding used to be a very lucrative economic activity along the wetlands but is no longer practiced now. Although some of the local people claimed to be former tourists guides, they were actively engaged in other activities from which they earn a living as a result of the total collapse of tourism in the area. This might perhaps be attributed to the fact that with the recent invasion of the wetlands by the invasive *Typha*, recreational activities such as tourism and swimming have virtually stopped. In the past, many tourists from within Nigeria and other parts of the world visit the Hadejia-Nguru wetlands for recreational activities which earned the local communities good incomes and huge revenue for the government. Palaearctic and Afrotropical migratory water birds were very much popular with the tourists especially the whites. Because of this reason and its enormous importance as a natural ecosystem, the Hadejia-Nguru wetland was declared as a Ramsar site. According to Ringim *et al.*, (2015), impacts of *Typha* on recreation and tourism, boating, swimming and diving activities are enormous. Consequently, tourists guiding is no longer practiced along the Nguru wetlands as a result of which no active tourist guide was found in the course of the conduct of the study.

**Conclusion:**

Based on the findings made by this study, it can be concluded that, large number of local communities living along the Nguru wetlands largely depend on the wetland resources for their livelihoods. The majority of these local people were young married men who lack basic western education but engaged in many different economic activities recontributing to the Gross Domestic Product (GDP) of the state and the nation at large. About 1.5 million people depend on the wetlands ecosystem for their livelihood in the form of agriculture, grazing resources, non-timber forest resources, fuel wood and fishing. However, many of the economic activities practiced by the local communities were seriously threatened by the invasion of Nguru wetlands by *Typha*. Most importantly, the majority of these local people were not well educated or skilled to secure white collar jobs so had to survive only by engaging in activities that have direct links with the wetlands such as farming, irrigation and grazing most of which were under threats by *Typha* invasion. Therefore, if effective control measures against the proliferation and invasion by *Typha* were not properly employed, the invasion will continue and the social and economic problems
associated with it will also escalate. Consequently, the possible scenario could be the total collapse of all economic activities practiced along the wetlands because the wetland would gradually lose its economic value thereby subjecting the livelihoods of about 1.5 million people at risk. In such a situation, the local communities will only be left with the option of migrating to other places in search of sources of livelihoods. If the local communities abandon all their activities along the wetlands and continue to migrate from the shores of the wetlands to other places, the consequences would spell nothing but doom to the survival of about more than a million people and to the economy of the Local Government, the state government as well as the Federal Government of Nigeria. Similarly, other neighbouring countries benefiting from the resources and products of the wetlands could also be affected.

**Recommendations:**

The shores of the Nguru wetlands were inhabited by thousands of local people engaging in various economic activities with direct links with wetlands resources as their only sources of livelihoods. However, the ever increasing invasion of the wetlands by *Typha* poses very serious threats to these people’s livelihoods. As a result, considerable number of them had already migrated to other places in search of means of livelihood. Thus, in order to curtail this menace protect the professions of these people to ensure their survival along the wetlands, the following recommendations are made:

1. Since the people depend on the wetlands as their source of drinking water which is threatened by *Typha*, modern sources of potable water such bore holes, protected wells, Tube wells and so on should be made available to the people by the concerned authorities.
2. Effective and efficient control measures of proliferation and invasion by *Typha* such as clearance, flooding with water, dredging, chemical methods and biological control should be employed by governments and other Non-Governmental Organisations like the Hadejia-Nguru Wetlands Conservation Project, Nigeria Conservation Foundation etc so as to resuscitate the slowly perishing economic status of the wetlands.
3. More efficient schools and other educational infrastructures should be provided so that the people can acquire the basic western education needed for development.
4. To achieve the desired development by the local people and for proper planning, the local people should be well enlightened on the importance of efficient family planning methods in order to control the rapidly increasing household sizes which consequently lead to overall population increase.
5. The people should be trained on modern methods of farming, fishing, grazing and irrigation amidst *Typha* invasion to boost their productivity.
6. Financial assistance in the form of loan facilities should be given to the local community members engaged in active economic activities to boost their productivity.
7. Entrepreneurial training in different skills should be given to the local communities in order to broaden their skills and make them self-dependent
8. More basic infrastructures such as electricity should be provided in the area in order to prevent the local people from migrating to other places.

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