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## An Assessment of Rural Household Vulnerability in the Hadejia-Nguru Wetlands Region, Northeastern Nigeria

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# **An Assessment of Rural Household Vulnerability in the Hadejia-Nguru Wetlands Region, Northeastern Nigeria**

**Ahmadu Abubakar Tafida<sup>1</sup> and Mala Galtima<sup>2</sup>**

## **Abstract**

The Hadejia-Nguru wetlands have long been recognized as a World Heritage Site notably for its supportive role to wild birds from Europe, Asia, and Australia. At times the functions of the wetlands have been tremendously jeopardized due to dwindling resources and thus affecting the lives of more than 1.5 million people. A number of projects were initiated by different international communities, such as the Department for International Development (DFID), aimed at fostering sustainable utilization of the natural resource base to improve the well-being of the people. The interventions have rarely succeeded, perhaps due to the lack of understanding of rural household vulnerability drivers. It is against this backdrop that this study undertook a household vulnerability assessment to determine the internal and external factors and their magnitudes in exacerbating the conflicts in the area. The data was obtained through the administration of 210 questionnaires in 15 communities of the wetlands region and analyzed principally using the vulnerability ladder, Analytical Hierarchy Process (AHP), and descriptive statistics. The results revealed that the external drivers, like invasion by *typha* grass and other aquatic plants, pests, and fluctuating water flow volumes, as the main sources of vulnerability rather than anthropogenic factors of resource over-exploitation, poor management, and lack of internal control mechanisms. The external factors were found to have multiplier effects on primary productivity and the livelihoods of the dependent communities subjecting them to poverty conditions and exacerbating intense competition and conflict over the depleting resources.

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## Introduction

Resource conflict is one of several destabilizing phenomena commonly cited as defining many of the extractive economies of the Global South and beyond (McNeish, 2010). In many areas around the world, particularly in developing countries, access to natural resources cannot be taken for granted. Competition over natural resources can lead to, intensify, or sustain violence (It should be noted here that conflict over natural resources is often part of, and exacerbates, a larger struggle over political, economic, cultural, or religious issues in society) (USIP, 2006). Natural resources are “materials that occur in nature and are essential or useful to humans, such as water, air, land, forests, fish and wildlife, topsoil, and minerals. Natural resources have perhaps played a major role in defining much of Africa’s public area, including power politics and resource distribution. They have also motivated and fueled armed conflicts in Africa and this has proven to be a hurdle in effective statecraft, while in times of full scale conflict it has been a hindrance to peace processes (Mwanika, 2010). It is therefore common knowledge that environmental problems coupled with demographic pressure aggravate tensions and instability.

The Hadejia-Nguru wetlands present a major area of flooded swampland in northeastern Nigeria. The wetlands are ecologically and economically important; they are on the list of Ramsar wetlands of international importance (Ogunkoya & Dami, 2007). Ramsar is an international treaty for conservation and sustainable utilization of wetlands, recognizing the fundamental ecological functions of wetlands and their economic, cultural, scientific, and recreational value. The wetlands are important for both breeding species and wintering and passage of Palearctic water birds. The estimated water bird population varies between 200,000 and 325,000. Three hundred and seventy seven bird species have been seen in the wetlands, including occasional sightings of the near-threatened Pallid Harrier and Great Snipe species.

However, the wetlands have been threatened by severe droughts and reduced rainfall for decades. More disturbing is the current environmental degradation and poor viability of the area occasioned by the poor hydrological flow, inefficient water management, and massive invasion of the obnoxious weed-*Typha* grass. The water that supplies the wetlands is gradually being shut off by a series of impoundments, notably the Tiga and Challawa dams. It is estimated that the Tiga dam has reduced flooding in the area by about 350km<sup>2</sup> (Viney, 2013). Low rainfall coupled with the dams has resulted in low flow volumes in downstream rivers and tributaries. The attendant poor hydrological flow enhanced siltation and eventual blockage of many channels of the rivers feeding the wetlands. Presently three (Kafin Hausa, Burum Gana, and Old Hadejia) out of the four main rivers that feed the wetlands have completely silted up leaving only the new Hadejia River. This latter river (at flood period), along with the river Katagum are currently the only systems that discharge into the Nguru-Gashua axis of the wetlands and which ultimately empty into Lake Chad through the Yobe River.

The estimated potential demand for water in the wetlands is put at  $4.528 \times 10^6 \text{M}^3/\text{y}$ , while mean available water supply to the system is  $1.739 \times 10^6 \text{M}^3/\text{y}$ , a deficit of 2.6 times (IUCN/NWCP, 1999). In spite of this shortfall in water supply the federal government has expressed its intention to build more dams, for example, the Kafin Zaki dam in Bauchi State. It is believed that any further impoundment of the up-streams will completely endanger the future of the wetlands and the livelihoods of the inhabitants will be highly threatened. This will compound the existing difficulties in water management issues with increasing demand from urban centers, and for agriculture and fisheries (Worldfish Center, 2008). The IUCN report (2006) indicated that during the last 30 years, parts of Komadugu-Yobe Basin (KYB) have been at the forefront of watershed development aimed at tackling the challenges of poverty alleviation and more recently environmental sustainability. The period witnessed unprecedented development at the upper reaches of the basin, which led to significant socio-economic advances but this was at a cost of severe environmental degradation and some socio-economic dislocations. The series of ecological problems, coupled with the current climatic changes and poor resource management in the area further accentuated the problems.

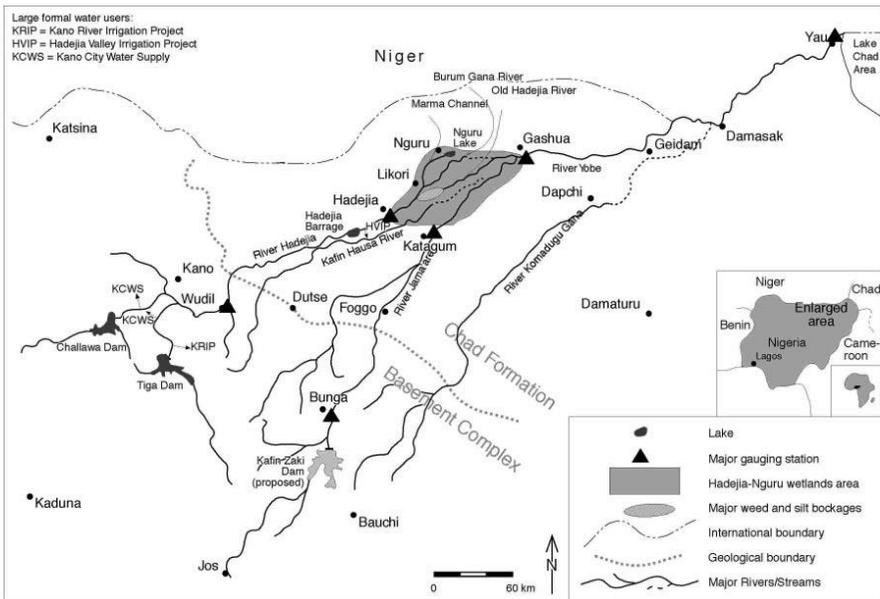
Over the years, the wetlands have witnessed a series of national and international projects to address the problems and to develop and sustain the natural resource base and the rich heritage of the region aimed at improving the well-being of the people. Despite the interventions, a study in the wetlands (Worldfish Center, 2008) indicated that the majority of the people (more than 50%) are getting poorer and live under a series of ecological and environmental challenges. Since the 1980s, the use of small gasoline-powered irrigation pumps has increased the cultivable land area of the wetlands resulting in conflicts over farmers' and cattle herders' land ownership and use (Kaugama & Ahmed, 2014). It is against this backdrop that this study attempts to analyze vulnerability and factors related to it as the best approach to determining the internal and external drivers as they affect the region, and to assess the types and levels of conflict in order to suggest sustainable resource utilization and management in the region.

## **Study Area and Methods**

The Hadejia-Nguru wetlands, which covers an area of about 84,000 square kilometers, lies between  $12^\circ 39'0''\text{N}$  and  $10^\circ 35'30''\text{E}$  and stretches across two main states (Jigawa and Yobe) of northeast Nigeria and receives the bulk of its water from the rivers Katagum, Jama'are, Kafin Hausa, and Burum Gana. These rivers, which mainly originate from the neighboring states of Kano and Bauchi, flow westerly and eventually unite at Gashua to form the Komadugu Yobe River system that empties into Lake Chad. The wetlands directly support about 1.5 million farmers, herders and fisherpersons (Kaugama & Ahmed, 2014). The area presents an economic hub for pastoralists, fisherpersons, and farmers practicing both rain-fed, flood-recession agriculture, and dry season farming using irrigation (Ladu, Sogbesan, & Tafida, 2013). In addition, it provides natural resources to outside populations such as firewood and dum palm leaves, normally used for making local

mat, ropes, and baskets. The wetlands provide employment, income, and food security to millions of farmers who integrate farming with fishing and livestock herding, the dominant rural economic activities of the area. Because of the annual flooding, the region is known to be very fertile and productive. The area provides grazing to about 506,000 cattle, 437,000 sheep, and 529,000 goats (Ovie, Ladu, & Tafida, 2006). The Bade people constitute the major ethnic group, although the Hausas, Fulanis, and Kanuris are also important in the area (Neiland, 1997). Figure 1 shows the study area (Hadejia-Nguru wetlands).

**Figure 1. Map of Study Area, Hadejia-Nguru Wetlands**



Source: Goes & Zabudum (1996).

The primary data for the study were mainly obtained through household surveys and focus group discussion (FGD). A total of 210 questionnaires were administered in 15 communities of the wetlands using stratification and simple random sampling techniques, from which 172 questionnaires were successfully retrieved and analyzed. The questionnaires elicited information on demography, policy practice, laws and compliance, vulnerability factors, and types of conflicts. The Vulnerability Ladder, Analytical Hierarchy Process (AHP), and Descriptive Statistics were used for the analysis.

The Vulnerability Ladder was computed by aggregating the individual households' answers and normalizing the scores (total=1) as follows:

Let  $V_i$  be a source of vulnerability (e.g.  $V_i$  = food insecurity),

i=1 to n,

Where n=total number of sources of vulnerability identified by the households in the community (i.e., n=10). Respondents were asked to identify the first five main sources of vulnerability for their individual household. For each source of vulnerability (Vi), a vulnerability score (kVi) across the community was then computed as follows:

$$kVi = \sum_{j=1}^5 \alpha_j x N_j \dots\dots\dots 1$$

Where Nj is the number of times (counts) the source of vulnerability Vi was mentioned by households in round j, (j=1–5), and  $\alpha_j$  is a weighting vector.  $\alpha_j$  is weighted  $0 < \alpha < 1$  and  $\sum_{j=1}^5 \alpha_j x N_j$  (0.33; 0.27; 0.2; 0.13; 0.07), in which case vulnerability sources identified as first main sources are weighted 0.33, second sources were weighted 0.27, third source: 0.2, and so forth (adopted from Mills et al. [2009] and modified).

An Analytical Hierarchy Process (AHP) was used to determine the most severe type of conflict in the 15 selected communities of the wetlands using the following procedures: First, seven possible criteria were identified as farmers-farmers, fishers-fishers, herders-herders, farmers-herders, fishers-herders, herders-migrant gatherers, and resource users-authorities. Second, five verbal ratings were identified and formed the basis for developing interview schedules for each focus group of the 15 communities. The verbal rating was “extremely severe,” “very severe,” “severe,” “less severe,” and “not severe.” A six-point scale (as in Satay, 1990) was used to represent the verbal judgment as follows: Extremely severe=6, Very severe= 5, severe=4, less severe =3, and not-severe=2. The results determined from the rating of the verbal judgment was used to develop a pair-wise comparison matrix for the seven types of conflicts for each community. Finally, the entries of the pair-wise comparison were then used to compute the relative weight for the respective types of conflicts using the Excel solver software. The consistency of the verbal judgment was tested for each pair-wise comparison matrix a using consistency ratio. The consistency ratio computed were compared with the benchmark of 20% as in Satay (1990), thus,

$$n_{max} = n_{max 1} + n_{max 2} + n_{max 3} + \dots\dots\dots n_{max n} \dots\dots\dots 2$$

The Consistency Index (CI) of the pair-wise comparison matrix is given as:

$$\frac{n_{max} - n}{n - 1} \dots\dots\dots 3$$

The Random Consistency (RI) of the pair-wise comparison matrix is given as:

$$\frac{1.98(n-2)}{n} \dots\dots\dots 4$$

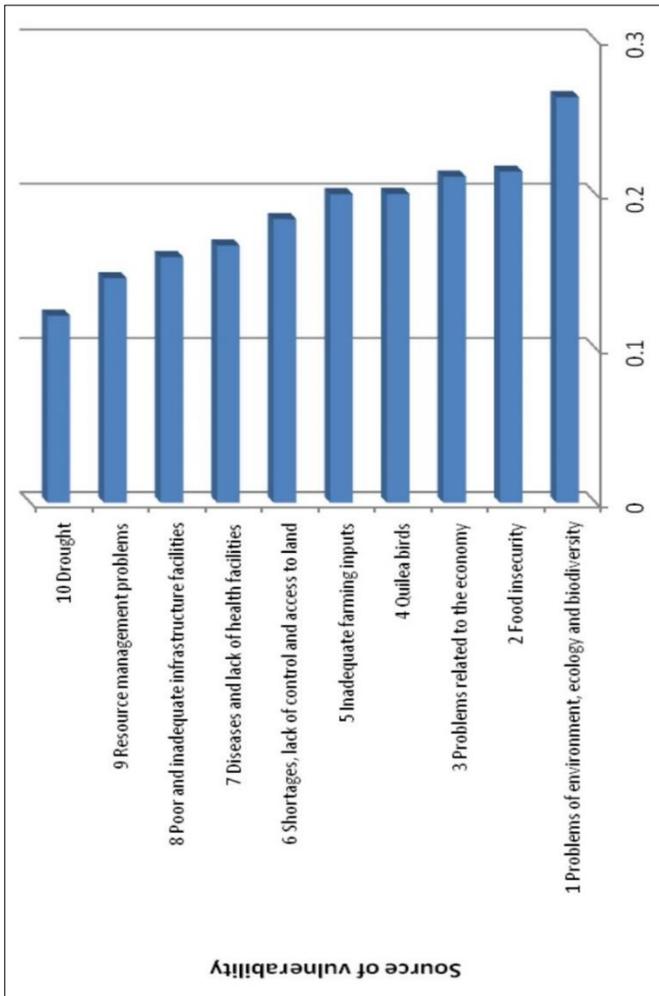
$$CR = \frac{CR}{RI} = 1 \dots\dots CR < 0.1 = \text{the consistency ratio} \dots\dots\dots 5$$

## Results and Discussion

### Vulnerability Assessment in the Wetlands

In Figure 2, the analysis of vulnerability ladder is presented in an attempt to bring forth a clear understanding of the most important risk factors that can jeopardize the welfare of the community members. Figure 2 shows that environmental, ecological, and biodiversity related issues are found to be the most important vulnerability factors in the area. The invasion by typha grass and river siltation remains enormous. This finding corroborates the reports by FAO (2006) and DFID (2009) that the poor rural people withstand the worst of environmental degradation, while being particularly dependent on natural resources. Economic related issues such as lack of access to credit facilities, inflation, and poor marketing were ranked as the second most important vulnerability factor in the wetlands. The dearth of credit services was found to affect the small-scale productivity, assets formation, incomes and food security, and hence rendering vulnerability. This conforms to the IFAD (2004) report that the people’s savings and other domestic resources are not sufficient to allow full exploitation of economic opportunities in the area. The lack of adequate inputs from crop farmers and fisherpersons is ranked as third important vulnerability factor in the wetlands (Figure 2). A number of these people have stated that high procurement costs of inputs, such as fertilizers (at the right time of need) and the acquisition of modern fishing facilities, have further increased their vulnerability. The need for good and advanced technology inputs by farmers and fishers are critical to these subsectors (FAO, 2006). Poor farm practices and management of resources have been issues of concern for many years in the area. Farmers are still operating at subsistence levels and the fishers are mere small-scale artisanal. Another vulnerability factor of importance is a shortage and lack of access and control to land for cultivation. This challenge could be attributed to population growth and the high demand for food particularly in the urban centers, and the changing land tenure system, thereby making the weak people inaccessible to lands.

**Figure 2: Vulnerability of Hadejia-Nguru Wetlands**



Source: Hadejia-Nguru Wetlands Field Survey, 2015

Food insecurity was ranked fifth on the vulnerability ladder. The majority of the households are subsistence farmers, and farm harvests are perhaps the main source of food, income, and basic family needs. Food security for a household according to the USDA (2006) means access by all members at all times to enough food for an active healthy life. Some of the social challenges facing the wetland areas include poor or lack of access to socio-economic infrastructure and services, public amenities and government services, lack of access to clean water or lack of

water resources for households, and low literacy and skills. In short, there is an absence of, or very poor infrastructure and institutional support for meeting minimum or basic human needs, decent shelter, food security, water and sanitation, electricity, social facilities, and amenities. Decent logistics' systems attract small sustainable enterprises and industries, artisanal and other technical skills, entrepreneurs, rural-urban linkages, local markets, and credit facilities. The IFAD (2012) reported that investment in rural infrastructure in Nigeria has long been neglected. Investments in health, education, and water supply have been focused largely on the cities.

Resource management is another major challenge facing the area in spite of the establishment of several laws and edicts over the years. Traditional resource management (*de facto*) has overshadowed the statutory management (*de jure*). The FAO (2006) reported that in most developing countries, the capacity to manage their natural resources is limited, and the absence of appropriate investment in the resource base may lead to its depletion in the future, and thereby jeopardize the overall social and economic benefits produced by the sector. Other vulnerability factors in the area as in Figure 2 include quela bird infestation and droughts.

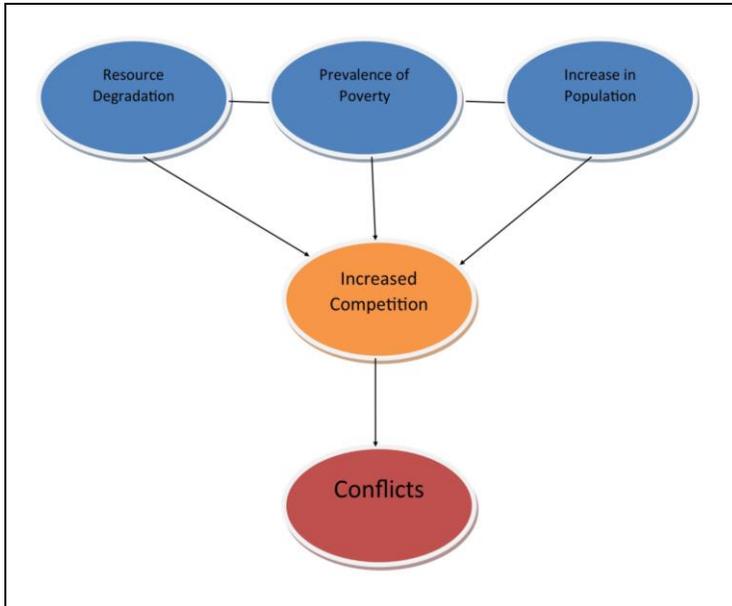
### **Perspectives on Conflicts in the Wetlands**

Central to the FGDs was that the wetland resources have been dwindling for more than two decades thereby affecting the people negatively, manifesting in the prevalence of poverty and increased vulnerability. This together with the increasing dependent population led to competition over land use and other natural resource bases such as forests, grazing areas, and fishing in the area. This led to conflicts between the various resource users as presented in Figure 3. The results of the FGDs from the 15 selected communities indicate that the wetland resources use conflicts are pandemic. The communities have expressed different views on conflicts, particularly the causes and its implications. The causes are linked to the open nature of the natural resources, poor land tenure system, scarcity and poor control of upstream water, weak governance of the resources, and cultural barriers. These factors led to inter and intra group conflicts of different forms on a continuous basis. Some of the consequences of conflict identified by the communities include loss of properties and at times lives, poor harvest, and lack of income.

The results in Table 1 show seven inter and intra group conflicts that exist among different resource users in the wetlands, all of which affect the livelihood of the people and sustainability of the natural resource base. The result laid more emphasis on the degree of severity of the conflicts rather than mere frequency of occurrence. It is revealed that the most severe conflict in the wetlands is between herders and farmers, which weighted 0.325141 on the scale of 1. This conflict usually occurs when herds graze on croplands or the residues without prior permission from the owners or when farmers cultivate across stock routes or in riverine grazing areas. Sometimes this conflict also happens when herds break the edges of farm ditches while crossing and/or polluting the water bodies. The herders who have been coming to the same area for many decades always claim land use

rights over the farmers who also believed in their rights over the same land, thus ensuing in conflicts.

**Figure 3: Causes of Conflicts in the Wetlands**



Source: Hadejia-Nguru Wetlands Field Survey, 2015.

The second most severe conflict is between various resource users and government institutional authorities with a weight of 0.145723. Most of the wetlands are under protection as wildlife sanctuaries, and forest reserves by the state and federal institutions through legal regulations, which are not respected by the user groups of the wetlands. It is common to see herds of cattle in forest reserves and gatherers seeking wild resources (e.g., Dum palm, fuel wood) in protected areas. The farmers often divert water from the main channel; upstream abstraction denies water to all categories of subsistence producers. In some instances, hunters poach for birds and animals in preserved areas. The fishers are also found fishing in protected reserves in the wetlands.

### **Types, Severity, and Causes of Conflicts in the Wetlands**

Farmer-farmer conflicts have been rated as the third most severe with a weight of 0.128214. This occurs mostly as a result of competition among the farmers for

access to farm lands upstream, which provides advantages for water abstractions from the main channel to the individual farm lands to support irrigation. This conflict sometimes resulted in the destruction of water pumping machines and farmlands. Conflicts between fisher-pastoralist is the fourth most severe (0.124944) and it usually occurs when herders destroy fishing gear or when fisherpersons block livestock water crossing points with fishing nets. The pastoralist and migrant gatherers conflict was rated 0.115205. This happens through cattle browsing of wild Dum palm, a major source of livelihood for the migrant gatherers. Intra-group conflict among the fisherpersons is rated sixth with a score of 0.083579. This occurs through the application of *dumba* nets (when not in agreement) and poaching of fish mostly by migrant fisherpersons in what is seen as exclusive fishing waters for the indigenous people.

### **Conflict Management in the Wetlands**

The dimensions of natural resource conflict require a good strategy to manage it. Warner (2000) reported that for good conflict management emphasis needs to be placed on the promotion of strategies for conflict prevention, targeted at the local level, both in post-conflict and pre-conflict situations. In the same vein, USIP (2006) reported that indicators of successful management of natural resources that have contributed to peace include the establishment of standards and agreements and efforts at cooperation, co-management, and conservation. Recent studies in Africa showed that a system of multi-sectoral and multi-stakeholder environmental conflict management diplomacy has increasingly become a major variable of genuine negotiation, mediation, and post-conflict reconstruction processes (Mwanika, 2010).

The FGDs in the 15 communities visited revealed that the traditional authorities most often than not settled conflicts between resource users in the wetlands. This is because the traditional authorities have put in place pre-emptive measures aimed at preventing the escalation of conflicts. It has been found that where the traditional institution is weak, or the conflict is highly severe, or there is a lack of trust in the traditional mediators, cases are referred to government security operatives available (e.g., police) or the courts. Resolution of conflicts in a typical village in the wetlands follow the traditional hierarchical arrangement of power in the system. A conflict within the community is first brought to the village elders. If they are unable to handle it, the case will be taken to the ward heads. Conflicts that could not be resolved at the ward levels will be taken to the village head and then to the district heads and eventually to the chiefs/emirs at the local government level. The magnitude of the conflict usually determines the stages of mediation, sanctions, and punishments meted.

Depending on the mediators, the adjudication varies from arbitrariness to court like situations providing evidence, witnesses, and other procedures. Nevertheless, conflicts are at times settled between two parties, without necessarily involving either the traditional or the government authorities. In the event of damage of crops or loss of animals, values might be attached to be paid by the offender, which might

be accompanied with an apology. Any repetition of similar offences by a person or group may attract community sanctions, either through fines or denial of certain privileges, such as community protection and support. However, there are two widely held views of group accusations on the integrity of the judges in the conflict resolution processes. It is believed in some communities that the pastoralists, being mostly wealthier than the farmers, bribe the mediators to win cases, whereas in some communities the judgments were said to mostly favor the farmers for the same reasons. However, in most of the communities, the result of the FGDs affirmed that the people are generally pleased with the system of mediation by the traditional authorities.

**Table 1: Types and Severity of Conflicts in the Hadejia-Nguru Wetlands**

	*FA FA	*FI FI	*HE HE	*FA HE	*FI HE	*HE MG	*RU AU	
<b>Baturia</b>	0.155	0.064	0.093	0.377	0.042	0.121	0.148	
<b>Pandum</b>	0.089	0.081	0.063	0.347	0.099	0.186	0.134	
<b>Gafta</b>	0.113	0.087	0.048	0.388	0.199	0.096	0.069	
<b>Jiyan</b>	0.109	0.085	0.075	0.399	0.118	0.083	0.175	
<b>Tage</b>	0.136	0.139	0.061	0.269	0.072	0.098	0.225	
<b>Dabileri</b>	0.117	0.053	0.105	0.285	0.129	0.081	0.231	
<b>Maje</b>	0.078	0.094	0.121	0.388	0.156	0.035	0.129	
<b>Ganuwar Kuka</b>	0.138	0.061	0.066	0.398	0.141	0.126	0.071	
<b>Guri</b>	0.143	0.126	0.116	0.099	0.131	0.162	0.193	
<b>Adiani</b>	0.143	0.137	0.131	0.126	0.168	0.164	0.184	
<b>Bambori</b>	0.165	0.035	0.061	0.377	0.123	0.099	0.139	
<b>Dabar Alhaji Giwa</b>	0.149	0.087	0.057	0.288	0.173	0.133	0.114	
<b>Wachakal</b>	0.096	0.057	0.041	0.389	0.133	0.104	0.181	
<b>Nguru</b>	0.133	0.091	0.106	0.358	0.162	0.111	0.039	
<b>Dagona</b>	0.159	0.055	0.082	0.388	0.031	0.132	0.153	
<b>Weight</b>	<b>0.13</b>	<b>0.08</b>	<b>0.08</b>	<b>0.32</b>	<b>0.12</b>	<b>0.12</b>	<b>0.15</b>	<b>1.00</b>

\*FAFA=Farmers-Farmers, FIFI= Fishers-Fishers, HEHE=Herders-Herders,  
FAHE=Farmers-Herders, FIHE=Fishers-Herders, HEMG= Herder-Migrant Gatherers,  
RUAU=Resource Users-Authorities

## **Awareness of the Existence of Policies and Laws Governing the Wetlands**

The results revealed that 92% of the respondents were aware of the existence of policies, laws, and edicts governing the wetlands, and only 8% of the respondents claimed not to have been aware of such policies and laws (Figure 4). Most of the policies and laws are geared towards rational exploitation and management of the wetland resources for its sustainability. Rogers, McEntegant, Hassan, Hadejia, and Zakama (2003) gave details of the federal and state instruments specifically the laws, edicts, and rules from 1938 to 1992, covering the environment, forestry, fisheries, and wildlife. However, awareness of policies and laws, in this context might not necessarily be translated to adherence, particularly as the mechanisms for implementation of such laws and policies are weak, which gave the people room for violation.

## **Compliance with Policies and Laws in the Wetlands**

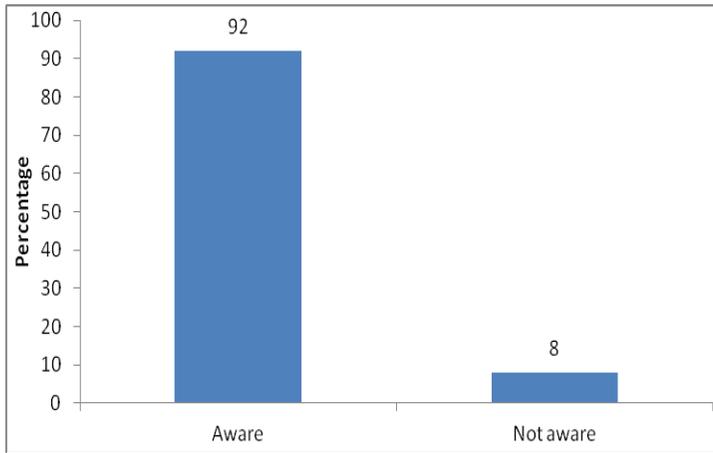
Policies and laws governing the wetlands' resources are evident from the existing literature (for example, Bene, Minjimba, Belal, Jolley, & Neiland, 2003; Neiland, Sarch, Madakan, Ladu, & Jaffry, 2005). The result in Figure 5 reveals that compliance with the existing policies and laws in the wetlands is generally poor. About 38% of the respondents attested that there is low compliance with the existing laws, 33% identified poor compliance, and only 3% of the respondents said the compliance was very good. Poor compliance with laws usually emanate from poor management and weak enforcement by the responsible agencies/authorities. Statutorily, all natural resources, land, forest, and water bodies belong to the government but at a point, even the government authorities to some extent cannot access the resources without the permission of the local community leaders. This according to Neiland, Sarch, Madakan, Ladu, and Jaffry (2005) is a clear indication of shifting ownership and responsibilities that do not help the system. Thus, the traditional management (*de facto*) is replacing the statutory management (*de jure*) practices.

## **Conclusion**

The Hadejia-Nguru wetland is significant in the sustenance of the livelihoods of millions of people in the region. But in the last few decades, the wetlands have suffered resource degradation due to environmental factors and ineffective management, which made the resource users more vulnerable and poor. This is compounded by population growth, which led to increases in competition for resource use and brought conflicts of different types and magnitude to the area. The most severe conflicts occurred between the farmers and herders. It is suggested that potential conflicts in resource use and management could be settled through a consensus-based decision-making approach involving the stakeholders, traditional institutions, and government authorities. The findings will assist policy-makers in

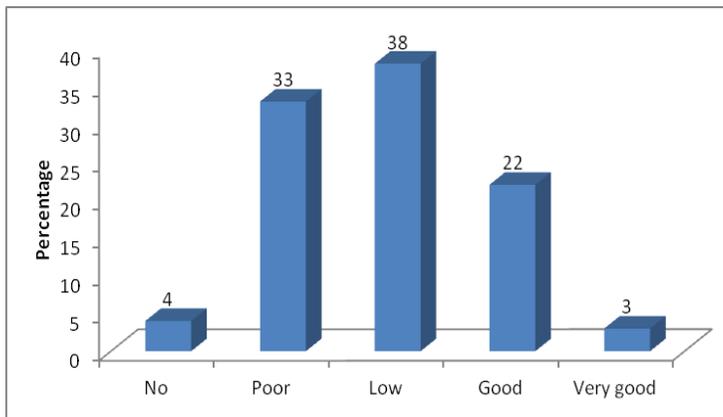
setting priority targets towards solving problems of the wetlands. It may also provide baseline information for possible project funding, particularly on conservation, sustainable livelihoods, and capacity building to improve the wetlands community knowledge on skills acquisition, and rational exploitation of their dwindling natural resource base.

**Figure 4: Awareness of Existence of Policy/Laws in the Wetlands**



Source: Hadejia-Nguru Wetlands Field Survey, 2015

**Figure 5: Compliance with Policy/Laws in the Wetlands**



Source: Hadejia-Nguru Wetlands Field Survey, 2015

## Recommendations

In addressing the vulnerability problems, priority should be given to environmental, ecological, and biodiversity related issues. Specifically, governmental authorities need to ensure the flow of water and its distribution to meet the demand for it, especially at downstream sectors. Holistic control of typha and other obnoxious weeds affecting the water, fishing, irrigation, navigation, and other livelihoods should be adopted, and finally, over-exploitation of the wetland resources should be controlled through evolving effective management strategies.

There should be a co-management body made of the government authorities (statutory) and the traditional system (customary) put in place to enhance conflicts resolution and facilitate the existing structures. The traditional authorities should be given more powers by this management body to settle conflicts between the various stakeholders. This will improve cohesion and sustainability of the traditional legal framework and encourage mutual co-existence in deriving the benefits of the wetlands' resources. There is need for training of government officials particularly on integration of policies/laws/regulations on wetlands natural resources. This will help in formulating deliverable and achievable by-laws at the community levels. The training should also focus on understanding legal enforcement mechanisms, procedures, and penalties for non-compliance.

Community members should be encouraged to engage in multiple livelihood portfolios particularly the off-farm activities to ease the pressure on land and other natural resources in the wetlands. This would reduce the vulnerability/poverty and lead to resource sustainability. The rural cooperative institutions should be strengthened and build their capacity to participate actively in community decision-making.

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