



Fish Species Diversity and Fishermen Income in Hashidu Fishing Community, Along River Gongola, Gombe State Nigeria

Abubakar M. Umar^{1*}, Simon Danladi², Mukthar Hassan³ Zainab Isah¹ and Suwaiba H. Kiman⁴

¹Department of Biological Sciences, Gombe State University, Gombe, Nigeria

²Department of Biological Sciences, Federal University of Kashere, Gombe State, Nigeria

³Department of Zoology, ModibboAdama University Yola, Adamawa State, Nigeria

⁴Department of Zoology, Gombe State University, Gombe, Nigeria.

Corresponding Autho: muabubakar@gsu.edu.ng

ABSTRACT

Fish species diversity and socioeconomic status of fishermen was carried out in Hashidu fishing community along river Gongola. Fish were collected from the fishermen on weekly basis over a period of six months cutting across both dry and rainy seasons. Gillnets of different mesh sizes were used to capture the fishes. Fish species were preserved using 10% formalin prior to transportation to laboratory for identification using appropriate fish identification keys. A well designed questionnaire was randomly given to 50 fishermen to extract information on the their socioeconomic status which was evaluated through their monthly income from fishing activities. The results show that the research area is rich with seventeen (16) fish species representing eleven (11) families. The study revealed that family Claridae had highest number of four (4) species, Characidae and Bagridae has two species each, the remaining families had only one species representing each of them. About 54% of the fishermen earn up to and above #30,000, while the remaining 46% of the fishermen earn below #30, 000 monthly which is the Nigerian national minimum wage as at the time of conducting this study. The income of fishermen in the study area is low, which may results to overfishing and negatively affects the conservation of fish species in the study area. Alternative source of income should be created such as farming in order to reduce pressure on the fish population and conserve the fish resources effectively.

Keywords: Fish species, Diversity, Socioeconomic status, Fishermen

INTRODUCTION

There is no doubt about the fact that artisanal or inland fisheries contributed immensely in providing food and employment to a large population of rural dwellers all over the world. More than 60 million individuals partake in small-scale fisheries (Ali and Abubakar, 2015; FAO, 2014a). An estimated 95% of the world 38 million fishers are situated in Africa, Asia, and Latin America (Worrall and Mendez-parra, 2017; FAO, 2005, 2009). Thus, improving artisanal fisheries can contribute in achieving the United Nation's (UN) agenda for sustainable development which involves integrating the separated social, economic as

well as environmental goals into a single line of action for the betterment of human being and their environment (Lynch et al., 2017). Nearly 17 million people in Bangedash alone, are directly or indirectly participated in fisheries and fisheries related activities. (Department of fisheries, 2020) Livelihood is sustainable when it can withstand stresses and shocks and preserve or improve its ability to recover without jeopardizing the natural resources base (Mohammed 2020). Artisanal fisheries means collecting fish and other aquatic animals from available water bodies (FAO, 2014b). It can play a role in poverty alleviation, even though cannot eradicate it completely. It is easy to practice because it

does not require high technological inputs and does not require extensive skill to practice (Lynch et al., 2017). The status of economic development of the country can determine the level of contribution of artisanal fisheries in providing food and economic security of the nation which is expected to be higher in developing countries of the world (Welcomme et al., 2010). Apart from providing source of animal protein and income inland fisheries can give chances for human empowerment when there is limited chances in other areas of the economy (Lynch et al., 2016). Artisanal fisheries can make tremendous contribution to the economy of the nations by providing a wide source of revenue generation especially when the landing sites are concentrated at a

specific areas to enable the revenue collectors easy access to the fishers and the fish marketers (FAO, 2005). In most developing countries, there is a link between artisanal fishery and abject poverty. The perception that artisanal fishers are the poorest in their communities is related to the unsustainable fishery practices that involve biological and economic overfishing (Béné et al., 2003).

MATERIALS AND METHODS

Study Area

The Gongola River is in the northeastern Nigeria, the principal tributary of the Benue River. The upper course of the river as well as most of its tributaries is seasonal streams, but fills rapidly in August and September.

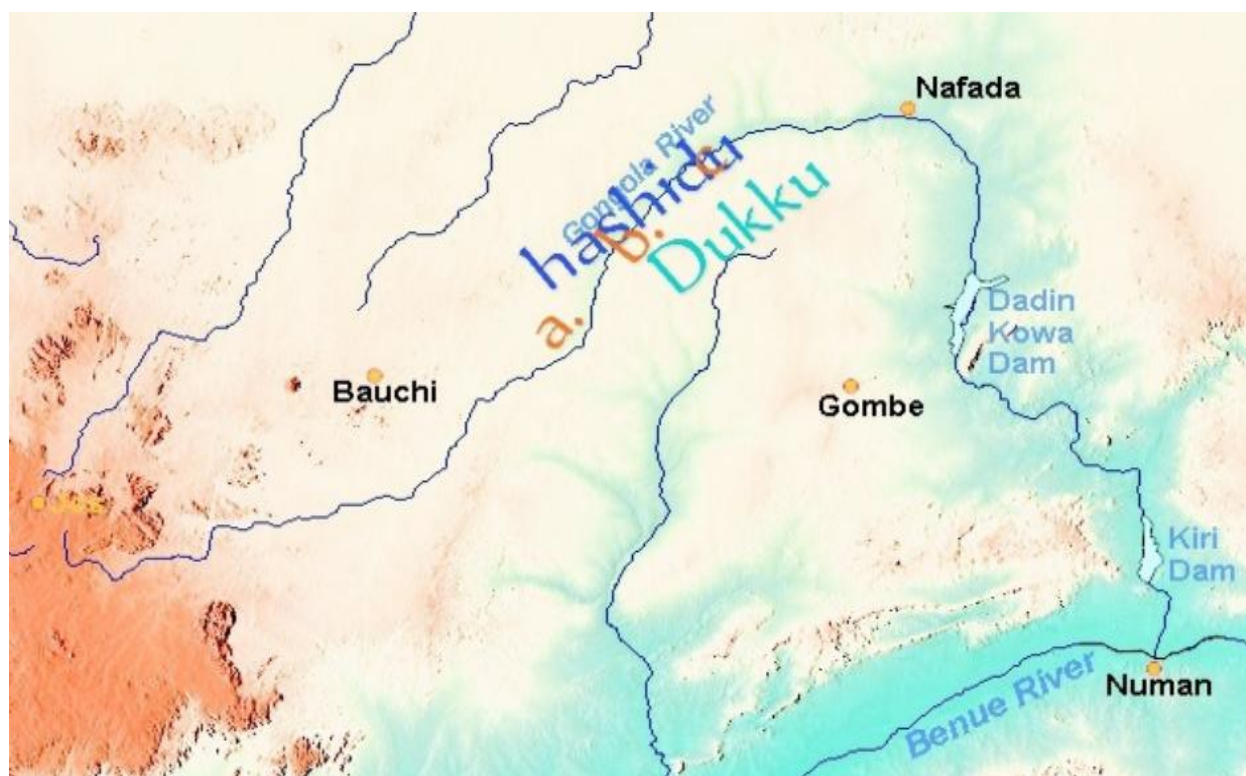


Figure 1: Map of River Gongola indicating Hashidu fishing community(Umar et al., 2025).

Fish Sampling Procedure

Fish were collected from the fishermen on weekly basis over a period of six months

cutting accross both dry and rainy seasons. Gillnets of different mesh sizes were used to capture the fishes. Fish species were preserved



using 10% formalin prior to transportation to laboratory for identification using appropriate fish identification keys (Holden and Reed, 1972; Anthony, 1982; Babatunde and Raji, 2004).

Determination of Fishermen Socioeconomic Status

A well designed questionnaire was randomly given to 50 fishermen to extract information on the their socioeconomic status which was evaluated through their monthly income from fishing activities.

RESULTS AND DISCUSSION

Fish Species Diversity

The results of fish species diversity in Hashidu fishing community is presented in Table 1. The result reveals that, the water body is rich with eleven (11) fish families and seventeen (16) fish species (Table 1). In terms of representation, the family Claridae had the highest number of individuals with four (4) different species, followed by Characidae and Bagridae with two species each, the remaining families (Cichlidae, Alestidae, Cyprinidae, Polypteridae, Malepteruridae, Mormyridae, Chaetodontidae, Protopteridae) had only one (1) species representing each of them (Table 1). Table 2 displayed the results of percentage composition of fish species identified in Hashidu fishing community. The Table indicated that, *Clarias gariepinus* had the highest percentage of 14.8%, followed by *Bagrus bayad* and *Oreochromis niloticus* with 14% and 13% respectively. The remaining fish species were having less than 10% as their percentage of occurrence. The percentage occurrence of fish families is contained in Table 3. The Table indicated that, family Claridae had the highest percentage (25%), followed by Bagridae and Characidae with

12.5% each, while the remaining families were having 6.25% accordingly. The percentage occurrence of fish families is contained in Table 3. The Table indicated that, family Claridae had the highest percentage (25%), followed by Bagridae and Characidae with 12.5% each, while the remaining families were having 6.25% accordingly.

The findings of the present study shown that Hashidu fishing community along river Gongola is rich in families, Claridae had seventeen (17) fish species representing eleven (11) families compared with the report of Oguzie, (1982), who carried out similar studies in Gubi reservoir Bauchi State and identified only seven species. In terms of representation, the family Claridae had the highest species with four different species. In terms of relative abundance, of the 17 species identified, *Clarias* stands out as the most dominant species. These findings slightly deviated from the findings of other researchers who confirm that *Tilapia* (*Oreochromis*) species are the most dominant species found in most West African water bodies (Ipinmoroti and Iyiola 2022; Ataguba et al, 2014). Abubakar et al., (2006) also reported *Oreochromis niloticus* as the most abundant species in Lake Geriyo. However, the result of this study agrees with that of some researchers, which include, Eleven species were identified in lake Botsumtwi, Ghana (Whyte, 1975) and in Dadin Kowa Dam, Nigeria (Nazeef and Abubakar, 2013). Abdullahi (2005) and Akanbi (2011), reported 26 species identified in River Benue around Boronji area and in Ogun estuary, Ogun State, Nigeria (Ekeanyanwu, 1980) in river Delmi Jos, where seven (7) genera were identified. Most of which *Tilapia* and *Oreochromis* species was not the dominant species during their research.

Table 1: Fish species identified in Hashidu fishing community along river Gongola.

Family	Species
Claridae	<i>Clarias gariepinus</i>
	<i>Clarias gabonensis</i>
	<i>Clarias camerunensis</i>
	<i>Clarias jaensis</i>
Bagridae	<i>Bagrus bayad</i>
	<i>Macropterus auchnogglanis</i>
Characidae	<i>Hydrocynus brevis</i>
	<i>Alestes leuciscus</i>
Cichlidae	<i>Oreochromis niloticus</i>
Alestidae	<i>Brachyalestes nurse</i>
Cyprinidae	<i>Labeo senegalensis</i>
Polypteridae	<i>Erpetoichthys calabaricus</i>
Malepteruridae	<i>Malepterirus electricus</i>
Mormyridae	<i>Mormyrus macrophhthalmus</i>
Schilbidae	<i>Schilbe mytus</i>
Protopteridae	<i>Protopterus annectens</i>

Table 2: Percentage of occurrence of fish species identified in Hashidu fishing community.

S/N	Fish species	Number Identified	% of Occurence
1.	<i>Clarias gariepinus</i>	39	14.8
2.	<i>Bagrus bayad</i>	37	14
3.	<i>Oreochromis niloticus</i>	35	13
4.	<i>Erpetoichthys calabaricus</i>	22	8.3
5.	<i>Brachyalestes nurse</i>	21	7.9
6.	<i>Malepterirus electricus</i>	17	6.4
7.	<i>Alestes leuciscus</i>	16	6.0
8.	<i>Schilbe mytus</i>	15	5.7
9.	<i>Mormyrus macrophhthalmus</i>	15	5.7
10.	<i>Labeo senegalensis</i>	14	5.3
11.	<i>Protopterus annectens</i>	14	5.3
12.	<i>Hydrocynus brevis</i>	13	5.0
13.	<i>Macropterus auchnogglanis</i>	3	1.1
14.	<i>Clarias camerunensis</i>	2	0.75
15.	<i>Clarias gabonensis</i>	1	0.37
16.	<i>Clarias jaensis</i>	1	0.37
Total	16	265	100

Table 3: Percentage of occurrence fish families identified in Hashidu fishing community.

Family	% of Occurrence
Claridae	25
Bagridae	12.5
Characidae	12.5
Cichlidae	6.25
Alestidae	6.25
Cyprinidae	6.25
Polypteridae	6.25
Malepteruridae	6.25
Mormyridae	6.25
Schilbidae	6.25
Protopteridae	6.25
Total	100%

Socioeconomic status of the fishermen in Hashidu Fishing Community

The result on the monthly income of fishermen in Hashidu fishing community is presented in Figure 1. The results indicated that, 46% of the fishermen earn below #30,000 monthly, 30% earn 30,000 in a month, and 24% earn above #30,000 monthly from the fishing activities (Figure 1). The findings of this study is similar to the previous report from coastal areas of Bangladesh, in which

more than half of the fishermen earned less than ten thousand Taka monthly (Mohammad and Ahmed, 2024). The socioeconomic status of most fishermen in India was reported to be low and therefore they cannot afford education, hospital and shelter to their family members (Emaldarani and Kanmani, 2019). Poor socioeconomic status of the fishermen can resulted in to poor conservation and management of the fisheries resources in the study area.

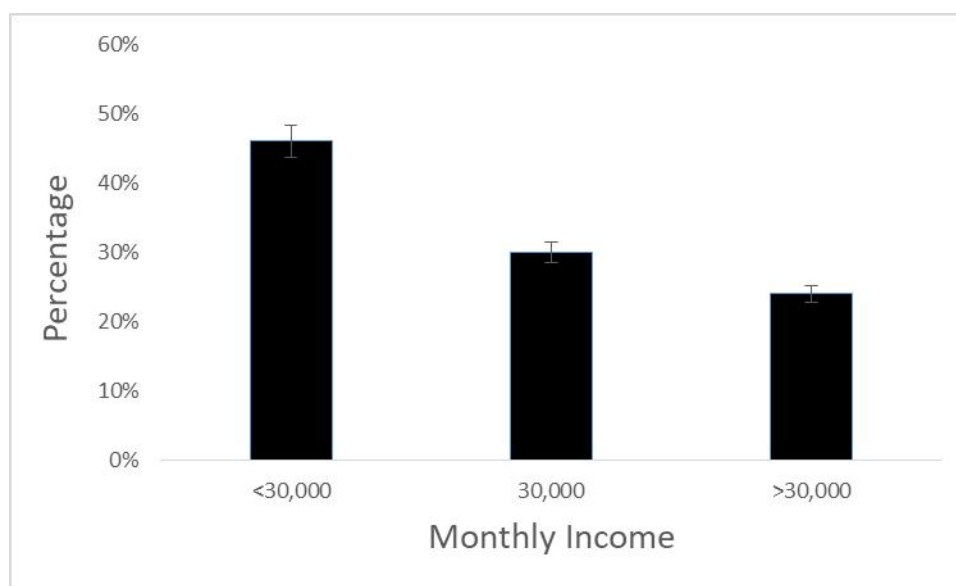


Figure 1: Monthly Income of Fishermen in Hashidu Fishing Community.



CONCLUSION

The water body is slightly rich in term of fish species and abundance. The income of fishermen in the study area is low, which may results to overfishing and negatively affects the conservation of fish species in the study area. Alternative source of income should be created such as farming in order to reduce pressure on the fish population and conserve the fish resources effectively. A routine evaluation of fish stock in the study area is recommended for proper conservation and management of the fisheries resources.

REFERENCES

- Abdullahi, M. (2005). Diversity and abundance of fish species in River Benue-Boronji Area. B. Sc. Project. Federal University of Technology, Yola, Nigeria.
- Abubakar K. A. (2006): A Study of aspect of productivity and stock status of *Oreochromis niloticus* and *Clarias gariepinus* in Lake Geriyo, Yola, Adamawa State. Phd. Thesis: F. U. T. Yola.
- Akanbi, A.A. (2011): Catch assessment, fish species diversity and abundance in Ogun estuary, Ogun state, Nigeria. B.Sc. Project. University of Agriculture Abeokuta, Nigeria. Pp 28
- Ali, J., & Abubakar, U. M. (2015). Fish Species Diversity and Abundance of Dadin Kowa Dam , Gombe State Nigeria. *International Journal of Innovative Research and Development*, 4(6), 374–378.
- Anthony, A. O. (1982): Identification of Nigerian fresh water fishes. Pp 418.
- Ataguba, G. A., Tachia, M. U., & Aminu, G. (2014). Fish species diversity and abundance of Gubi Dam, Bauchi State of Nigeria. *Biological Diversity and Conservation*, 7(2), 1-9.
- Babatunde, D. O. & Raji, A. (2004): Field guide to Nigeria freshwater fishes. Federal college of freshwater fisheries technology New Bussa Nigeria. 104pp.
- Béné, C., Neiland, A., Jolley, T., Ovie, S., Sule, O., Ladu, B., & Quensiere, J. (2003). Inland fisheries, poverty, and rural livelihoods in the lake chad basin. *Journal of Asian and African Studies*, 38(1), 17–51. <https://doi.org/10.1177/0021909603038010102>
- Department of fisheries (2020) Ministry of fisheries and livestock, Dhaka, Bangladesh. Annual Report.
- Ekeanyanwu, A.A (1980): A survey of macro invertebrates and fish fauna in relation to water quality in Delmi River Jos. B.Sc. Thesis Zoo dept. Uni-Jos Nigeria.
- Emaldarani. S & Kanmani J, A. (2019) Socio-Economic Status of Fishermen Community (with special reference to Nagapattinam Town, Tamil Nadu). *Journal of Emerging Technologies and Innovative Research (JETIR)*, Vol. 6(5), 446-449.
- FAO. (2005). *Increasing the contribution of small-scale fisheries to poverty alleviation and food security*. Rome.
- FAO. (2009). *The state of world fisheries and aquaculture-2008 (SOFIA)*. Rome Italy.
- FAO. (2014a). *CWP Handbook of Fishery Statistical Standards Section G: Fishing Areas – General*. Rome Italy.
- FAO. (2014b). *The state of world fisheries and aquaculture. Food and Agriculture Organization of the United Nations* (Vol. 2014). <https://doi.org/92-5-105177-1>
- Holden, M. & Reed, W. (1972): West African freshwater fish. Pp 4-29.
- Ipinmoroti, M. O. & Iyiola, A. O. (2022) Diversity, distribution and abundance of fish species in Lake Asejire,



- Oyo State, Nigeria. *The Zoologist*, 21:49-56,
- Lynch, A. J., Cooke, S. J., Deines, A. M., Bower, S. D., Bunnell, D. B., Cowx, I. G., & Beard, T. D. (2016). The social , economic , and environmental importance of inland fish and fisheries. *Environmental Review*, 24(February), 115–121.
- Lynch, A. J., Cowx, I. G., Fluët-chouinard, E., Glaser, S. M., Phang, S. C., Beard, T. D., & Youn, S. (2017). Inland fisheries – Invisible but integral to the UN Sustainable Development Agenda for ending poverty by 2030. *Global Environmental Change*, 47(2), 167–173.
<https://doi.org/10.1016/j.gloenvcha.2017.10.005>
- Mohammed Shaheen Alam, & Ahmed Yousuf (2024). Fishermen community livelihood and socio-economic constraints in coastal areas: An exploratory analysis, *Environmental challenges*, Volume 14, 100810 .
- Nazeef, S. & Abubakar, U. M. (2013). Diversity and condition factor of fish species of Dadin Kowa Dam Gombe State, Nigeria. *Greener Journal of Biological Sciences*, 3 (10), 350-356.
- Oguizie, F. (1982). Aspect of feeding behavior and a chemotrypsin in the chichlid *Sarotherodon niloticus* (Trewavas) in Gubi Reservoir Bauchi State. M.Sc. thesis Zoology department. Uni-Jos Nigeria. Pp30.
- Umar, Abubakar M., Simon Danladi, Zainab Isah, Suwaiba H. Kiman, Abubakar Aisami, & Nata'ala Bako. 2025. Water Quality Assessment of Hashidu Reservoir Along River Gongola, Gombe State Nigeria. *Asian Journal of Fisheries and Aquatic Research* 27 (2):112-19.
<https://doi.org/10.9734/ajfar/2025/v27i2885>.
- Welcomme, R. L., Cowx, I. G., & Coates, D. (2010) Fishery exploitation system and their impact on socio – economic status of fisherman in some beels of Assam. *Journal of Inland Fisheries Societies of India* 1994; 26:pp51-58.