

INTRODUCTION

The African catfish, *Clarias gariepinus*, is a highly versatile and widely distributed freshwater fish species found in various water bodies across Africa (Teugels, 1986). This species is known for its hardy nature, adaptability to diverse environmental conditions, and rapid growth rate, making it a valuable resource for both capture fisheries and aquaculture (Adebayo & Popoola, 2008). Understanding the reproductive biology and fecundity of fish species is crucial for effective fisheries management and conservation strategies (Mathewos et al., 2018). The fecundity of *Clarias gariepinus*, commonly known as the African catfish, is a subject of considerable interest within the fields of fisheries biology and aquaculture. Ero Dam, located in Ikun Ekiti, Ekiti State, Nigeria, provides a vital habitat for *Clarias gariepinus*, making it an important site for studying the species' reproductive biology. The importance of studying fecundity in Ero Dam also extends to its implications for local aquaculture practices. By understanding the fecundity patterns and the factors that enhance reproductive success in this specific habitat, aquaculturists can develop more effective breeding and management practices to maximize production (Ogunji et al., 2012).

MATERIALS AND METHODS

The Study Area

The study was carried out in Ero reservoir located at Ikun-Ekiti in Moba Local Government Area of Ekiti State, Southwest, Nigeria. The area is known for being a habitat for various fish species attracting fishermen and supporting livelihoods. The ichthyofauna of the reservoir include *Hepsetus odoe*, *Oreochromis niloticus*, *Clarias gariepinus*, *Parachanna obscura* and *Sarotherodon galilaeus*.

Sample Collection

Fifteen samples of *Clarias gariepinus* were obtained at the landing site of fishermen at the reservoir from March 2024 to June 2024. The fishermen used traps, gill nets and cast nets with mesh sizes ranging from 38.10 mm to 180.00 mm to capture fish samples. Fish were captured between 06:00 am - 08:00 am. Water from the reservoir was added to the samples at the point of collection and transported to the laboratory for further investigations. The collected fish samples were identified using fish identification guide by Teugels (1986); FAO (1992); Skelton (1993); Olaosebikan and Raji (1998).

Biometric Measurement of Fish Samples

This entailed the measurement of the fish weight using digital balance to the nearest 0.1g while standard length and total length of the fish were measured using standard procedures (Pauly, 1983).

Estimation of Sex Ratio of Fish Samples

Sexes were determined by visual observation of external openings. The sex ratio was determined by counting the number of male and female in the samples. The ratio of males and females was calculated as follows:

$$\text{Sex Ratio} = \frac{\text{number of males}}{\text{number of females}}$$

Estimation of Fish Fecundity

The female fish was dissected and its mature ovary was excised for fecundity examination as previously carried out by Idowu (2007). The mature egg mass was weighed, then three subsections each of 1g was taken from the anterior, middle, and posterior regions of the ovary respectively. Ova from these subsections were separated and counted. The fecundity of the sample was calculated according to Yelden and Avsar, (2000). Fecundity, $F = \frac{\text{ovary weight} \times \text{number of eggs in sub sample}}{\text{Weight of sub sample}}$

STATISTICAL ANALYSIS

Values of fecundity, weight and length were analysed into mean and standard error using version 25.0 (IBM Corp., Armonk, NY, USA).

RESULTS

Table 1: The Samples, Weights, lengths, Fecundity

Sample	Weight (g)	Length (cm)	Fecundity
1	60	8	8,500
2	80	11	9,400
3	60	9	8,300
4	100	12	10,205
5	70	11	8,800
6	80	11	9,200
7	110	13	10,500
8	110	12	10,300
9	70	10	8,750
10	90	12	9,700
11	120	14	11,700
12	100	12	10,150
13	80	12	9,500
14	90	13	9,600
15	120	15	11,500
Average	89.3	11.6	9,794

The weights of the samples range from 60g to 120g, with an average weight of 89.3g. The lengths vary from 8cm to 15cm, averaging 11.6cm. Fecundity, or the number of offspring produced, ranges from 8,300 to 11,700, with an average of 9,794. Notably, heavier and longer samples tend to have higher fecundity, suggesting a potential correlation between the physical attributes of the samples and their reproductive output. For instance, samples with weights around 110g and lengths between 12cm and 15cm exhibit higher fecundity values, often exceeding 10,000. This pattern indicates that both weight and length might be contributing factors to fecundity.

Table 2: The weights, number of fish, mean fecundity and fecundity range

Weight of fish	Total number of fish	Mean fecundity	Fecundity range
60	2	8,400±141.4 ^a	9,300-9,500
70	2	8,783±35 ^a	8,750-8,800
80	3	9,366±152.7 ^b	9,200-9,500
90	2	9,650±70.7 ^b	9,600-9,700
100	2	10,177±38.8 ^b	10,150-10,205
110	2	10,400±141.4 ^c	10,300-10,500
120	2	11,600±141.4 ^c	11,500-11,700

Means in the same column with different superscript have significantly different fecundity (P < 0.01)

The data shows a clear trend where the mean fecundity increases with the weight of the fish. For instance, fish weighing 60g have a mean fecundity of 8,400±141.4, with a range of 9,300-9,500, while fish weighing 120g exhibit the highest mean fecundity of 11,600±141.4, with a range of 11,500-11,700. The fecundity ranges within each weight category indicate some variability, but the overall trend suggests that heavier fish tend to produce more offspring. Furthermore, the significant differences in fecundity between weight categories, denoted by different superscripts (a, b, c) and a P-value of less than 0.01, highlight that weight is a critical factor influencing fecundity.

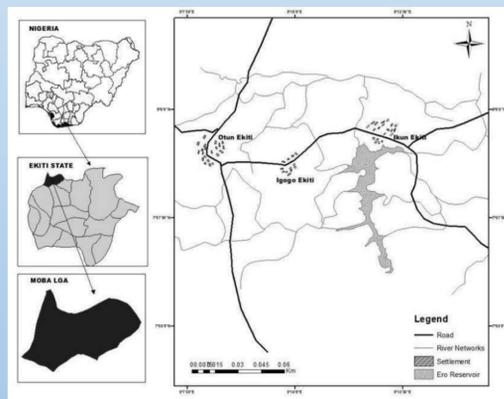


Figure 1: Map of Ekiti Showing the Location Ero Reservoir.

Source: Odeyemi et al., 2025.

RESULTS CONTD

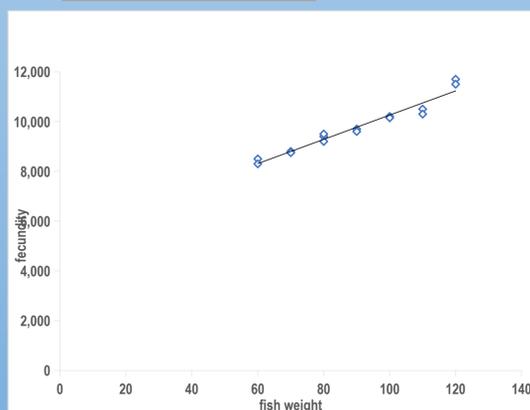


Figure 2: The linear relationship between fecundity and fish weight.

There was a significantly high correlation between fish weight and fecundity in *C. gariepinus*.

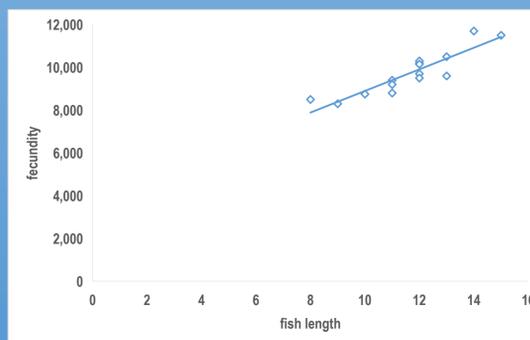


Figure 3: The linear relationship between fecundity and fish length.

As the length of the fish increases from 8 cm to 15 cm, fecundity also shows an upward trend. For example, fish measuring around 8 cm in length have a fecundity of approximately 8,000, while fish measuring 15 cm exhibit fecundity levels reaching around 12,000. This positive correlation suggests that longer fish tend to produce more offspring. The trend line reinforces this linear relationship, indicating a consistent increase in fecundity with increasing fish length. This visual representation indicates that length is a significant factor influencing fecundity in *Clarias gariepinus*.

CONCLUSION

Generally all the measured parameters still remained higher even in the downstream part of the river water showing sub-lethal concentrations of contaminants in the water. The volume of these discharges into the analyzed dam was already overtaxing their capacity for self-purification and the prevailing practice of unregulated and uncontrolled discharge of such wastes into water bodies constitutes serious abuse and portends serious danger to the resident species and beneficial use to the municipality. It could be seen in this study that the Ero Dam water was grossly polluted and the level of pollution decreased downstream and it was much higher. Therefore, the data generated in this study, confirmed the presence of sub-lethal concentration of pollutants in Ero Dam and that the fish population are surviving under severe stress, which is apparent from the heavy metal load in the body of resident fish species. Drinking of water and consumption of fishes from these polluted waters could be detrimental to health of humans in terms of bio-concentration which could make the body to be vulnerable to disease outbreak and breakdown of immune system in man.

RECOMMENDATIONS

1. Existing environmental laws should be duly enforced regarding environmental health
2. A good bio-monitoring program is needed to be established where the hydro-logical and geo-morphological characteristics, the chemical and physical water quality and the river vegetation are taken into consideration as these all affects the aquatic system.
3. Illegal and indiscriminate fishing activities by local fish farmers which is capable of exposing the river to pollutants should be discouraged.
4. The use of brutal means of harvesting fish like electric currents, poisonous plants, dynamites and addition of chemicals, as practised in the area must be stopped.

REFERENCES

Adebayo, O. T., & Popoola, O. M. (2008). Induced spawning of African catfish (*Clarias gariepinus*) using different hormones. *African Journal of Biotechnology*, 7(14), 2400-2404.

Adeyemi, A. A., & Olaleye, V. F. (2011). Catfish culture in Africa: Progress, challenges and prospects. *African Journal of Agricultural Research*, 6(6), 1278-1287.

Bagenal, T. B. (1978). Aspects of fish fecundity. In S. D. Gerking (Ed.), *Ecology of Freshwater Fish Production* (pp. 75-101). Blackwell Scientific Publications.

Idowu, E.O., 2007. Aspects of the Biology of *Hepsetus Odoe* in Ado-Ekiti Reservoir Ekiti, Nigeria Ph.D thesis, University of Ibadan, Ibadan, Nigeria.

Mathewos, T. K., Abebe, G. and Brook, L (2018). Reproductive Biology of Commercially Important Fish Species in Lake Lago, Ethiopia. *Asian Fisheries Science* 31: 319-339.

Ogunji, J. O., Nwakanma, C., & Ochang, S. N. (2012). The influence of environmental conditions on the fecundity and growth performance of *Clarias gariepinus* (Burchell 1822). *Journal of Applied Ichthyology*, 28(3), 453-457.

Olaleye, V. F. (2005). A review of reproduction and gamete management in the African catfish, *Clarias gariepinus* (Burchell, 1822). *Ife Journal of Science*, 7(1), 63-70.

Olaosebikan, B. D., & Raji, A. (1998). Field guide to Nigerian freshwater fishes. Federal College of Freshwater Fisheries Technology

Teugels, G. G. (1986). A systematic revision of the African species of the genus *Clarias* (Pisces; Clariidae). *Annales du Musée Royal de l'Afrique Centrale, Sciences Zoologiques*, 247, 1-199.

ACKNOWLEDGEMENTS



I thank Dr. Tunji Olowolafe foundation for the financial support to attend the World Aquaculture Congress 2026.



I thank Ekiti State University, Ado-Ekiti, Nigeria for granting me the privilege to attend World Aquaculture Congress 2026.