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The problems and prospects of Aquatic life in Hadejia Dam, Jigawa State Nigeria

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Abstract
This work on the problems and prospects of aquatic-life in Hadejia Dam, Nigeria was carried out based on questionnaire. The questionnaire contained typed questions fifty respondents randomly selected within Hadejia local government area, were considered as the total population of the area. The percentages of responses were calculated. Pollution, flood, water salinity and turbidity were the major catastrophic event facing aquatic life organization in the area.

Introduction

The phrase problem and prospect of aquatic lives has to do with four main character's which are; problem, prospect, aquatic and lives.

- Problem according to Macmillan school dictionary is anything which causes trouble or difficulty
- Prospect on the other hand according to Macmillan school dictionary is said to be the possibility that something will happen in future while
- Aquatic which is a biological term and is found under classes of habitat means anything living in water or near water.

Hadejia emirate consist of eight local governments out of twenty seven local government of Jigawa state, it is located in the north eastern part of the state, it covers an area of six thousand nine hundred and sixty three square kilometers (6,963 sqkm) the area is enrich with grazing lands and fishing lakes which ensure the survival of different species of plants and animal's, the predominant occupation of people in the area is farming followed by fishing activities due to the large water bodies and fertile agriculture land. In 1980 the federal government of Nigeria laid foundation for the construction of dam which covers over 100km of land till date the dam is still under construction as a result the aquatic lives are not stable, they have been facing some threats in environment due to the different water pollution in the dam.

In this work "The problem and prospect of aquatic life in Hadejia Dam" these problems are to be examined and provided with lasting solutions to help in the growth and development of these aquatic lives specifically in the dam.

Statement of the problem

Increase in global pollution in terrestrial and aquatic environments brought about serious threat to both human and plant lives, this call the attention of researcher's to work nad identify problems and prospects of aquatic lives in Hadejia Dam.

It seem that the major problem facing aquatic habitat is water pollution and are eutrophication. We shall examine the problems and provide some lasting solutions to them.

Eutrophication is one of the accidental pollution which causes the death of both zoo and phytoplankton's in the dam, decomposition of algae by bacteria lead to decrease of oxygen demand and causes suffocation and reeducation in the range of aquatic lives in the dam.

Sewage are mainly from animal excrete, which finally find it way in to the dam by rainfall and decomposed by bacteria, these also reduces oxygen content and eventually fishes becomes suffocated and die

Aim and Objectives

The aims and objectives of this work among others include the following:

- To identify some of the aquatic organism living in Hadejia dam
- To investigate the effects of catastrophic events on aquatic lives in Hadejia dam
- To study the major water pollution in Hadejia dam
- To investigate for how long this problems were in existence
- To forward some lasting solution to these problems faced by aquatic lives

Purpose of the Study

Pollution is a global catastrophic event that occurs in terrestrial and aquatic environments world Wide this motivate the researcher to undertake this work, toward examining the problems and prospects of aquatic inhabitants of Hadejia dam.

Significance of the Study

The results obtained from this work would be significant and useful to the water bodies, farmers will gain a lot because their loses will be checked, Governmental agencies such as JARDA and FADAMA will have hints on designing, planning and controlling aquatic pollution, the result obtained would enable the government to enact laws to check the disaster of pollution and lastly the researcher's will also be significant to the future generation and to cultivate desirable habits to the interest of aquatic organisms.

Research Question

This work is intended to collect data using the following research questions;

1. Is there any water pollution in this area?
2. If yes, what are the major pollutants?
3. What is the effect of these pollutants on aquatic life?
4. What type of catastrophic effects on aquatic life?

Materials and Methods

Method of Data collection

The data collection is the use of questionnaire. The questionnaire contained typed questions. The questions will either be open or closed type aimed at providing appropriated result.

Sample and sampling strategy

The sample of this work consists of fifty (50) respondents randomly selected within Hadejia local government area to represent the total population of the area. However, the questionnaires were distributed to the respondents in equal proportion as such fifty (50) questionnaires of fifty respondents respectively.

Method of data interpretation

The data obtained is interpreted in tabular form in which the responses are analysed.

The percentages of responses are however calculated using the formula of simple percentage i.e. the number of respondents over the total number of questionnaire distributed multiplies by one hundred over one. Thus;

$$\frac{\text{Number of respondents}}{\text{total number of Questionnaire distributed}} \times \frac{100}{1}$$

Results and discussion

Table 1: Analysis of the sex of respondents

Sex	No of Responses	Percentage
Male	45	90%
Female	05	10%
Total	50	100%

From the above table, it seems that, majority of the respondents were male with 90% of the total questionnaire returned while 10% constitute the female respondents who were five in number respectively.

Table 2: Analysis of the age of Respondents

Age	No of Responses	Percentage
15 – 20	11	22%
20 – 25	21	42%
25 – 30	9	18%
30 – Above	9	18%
Total	50	100%

The table shows the range of respondents each ages group has it's percentage. Which indicated that the majority were between 20 – 25 years with 42% out of 100%

Table Three 3: Analysis of locality of respondents

Locality	No of Responses	Percentage
Hadejia	42	84%
Out of Hadejia	07	14%
Within Hadejia	01	02%
Total	50	100%

Table there above reveals the locality to which the respondents resides, where most of respondents dwell in Hadejia with 84% and 7 respondents who lives out of Hadejia with 14% while 1 respondent representing 4% reside in the emirate

Table Four 4: Analysis of Respondents Level of Education

Education level	No of Responses	Percentage
Secondary	12	24%
Post Secondary	29	58%
University	09	18%
Total	50	100%

Most of the respondents undergone schools where 12 respondents with 24% of the total respondents that attendant secondary school, 29 respondents representing 58% have attended tertiary level while 9 respondents with 16% attended university education respectively.

Table Five 5: Question 1: What are the different types of aquatic habitat in your area

Response	No of Responses	Percentage
Dam	3	6%
Stream	01	2%
River	29	58%
All of the above	17	34%
Total	50	100%

The table above represents respondents frequency of the respondents of particular response. And the percentage of each respectively. You can deduce that three respondenst said that the dam is typical aquatic habitat available in their area with 6% from the total respondents. However, one respondent representing 2% revealed that Streams is found available in their area while 29 respondents indicate that river is the major aquatic habitat in their area with the highest percentages 58% out of the total percentage and 17 respondents that represent 34% said all of the habitat mentioned above can be found available in their area. Therefore, the area can be describe as aquatic habitat dominated with different water bodies.

Table six 6: Question 2: what are the types of aquatic organisms found in dam?

Response	No of Responses	Percentage
Fish diff. varieties	24	48%
Zoo planktons	02	04%
Python planktons	04	08%
Amphibians	01	02%
All of the above	19	38%
Total	50	100%

From the table the question asked about the type of aquatic organism found within dam where 24 out of 50 respondents responded representing 48% said fishes of different varieties are the common organism found in the dam, two respondents responded to zoo planktons with 4%, 4 respondents responded to phytoplanktons with 8%, only one respondent to amphibians as aquatic organism found in the dam with 2% and 19 respondents with 38% who responded all of the above live in the dam.

Table 7: Question 3: What are the major types of pollution?

Response	No of Responses	Percentage
Water	40	80%
Land	05	10%
Air	04	8%
Nose	01	2%
Total	50	100%

The question asks on the types of pollution arising in the aquatic dam where 40 respondents representing 80% of the total percentage said water pollution is the major pollution that take place in aquatic habitat and four

respondents reveal that air pollution is one of the environmental problem in their area with 8% while one respondent said noise pollution 0bserved in Hadejia dam with 2% similarly five respondents with 10% responded on land pollution.

Table 8: Question 4: is there any water pollution in your area?

Responses	No of Responses	Percentage
Yes	45	90%
No	05	10%
Total	50	100%

Here, 45 respondents representing 90% said yes, there is unchecked water pollution spoiling aquatic environment in their area. While 5 respondents answered no, there is no any case of pollution in our area.

Table nine 9: Question 5: What are major pollutants?

Responses	No of Responses	Percentage
Un-treated sewage	12	24%
Agricultural waste	23	46%
Chemical /oil spillage	05	10%
All of the above	10	20%
Total	50	100%

The table representing the respondents of the question that asked on pollutants which pollutes the habitats, 12 respondents said untreated sewage is the major pollutants that pollutes aquatic lives with 24%, 23 respondents representing 46% pointed on agricultural wastes as the main pollutants in aquatic environments while 5 respondents with 10% indicated that the chemicals and oil as a result of spillage are the main pollutants to aquatic environment, lastly ten respondents that represent 20% agreed that all the pollutants mentioned are continually being discharged to aquatic environment to cause pollution.

Table 10: Question 6: what are the effects of those pollutants on aquatic live?

Responses	No of Responses	Percentage
Ruin aquatic life	6	12%
Kills aquatic life (organism)	29	58%
Low reproduction rate	10	20%
All of the above	05	10%
Total	50	100%

From the above table, the question asked on the effects of pollutants on aquatic lives, six respondents said that pollutants when introduced in aquatic habitats will ruin aquatic life with 12%, 29 respondents representing 58% said that, those pollutants can kill aquatic organism, where 10 respondents representing 20% of the total percentage said pollutants always reduce the reproduction rate of aquatic fishes and 5 respondents with 10% showed that all of the above mentioned affect aquatic lives negatively.

Table 11: Question 7: What type of catastrophe do aquatic organisms experience?

Responses	No of Responses	Percentage
Flood	09	18%
Turbidity	05	10%
Salinity	10	20%
Pollution	26	52%
Total	50	100%

The table above presents the responses of the questions on the type of catastrophe experienced by the aquatic organism on which 9 respondents said floods of rivers is experienced by aquatic environment with 18%, 5 respondents representing 10% said the water turbidity became one of the catastrophe experienced by aquatic lives, meanwhile salinity have effect on aquatic lives was said by 10 represents 20%. Finally pollution is the major catastrophe devastating aquatic lives generally with 26 respondents representing 52%.

Table 12: Question 8: What are the effects of catastrophe mentioned above?

Responses	No of Responses	Percentage
Eutrophication	11	22%
Animal are exposed	10	20%
Destruction of aquatic organization	29	58%
Total	50	100%

The table above shows the responses on the question which asked on the effect of the catastrophe mentioned in the above table and 11 respondents representing 22% noted that eutrophication is one of the effects of the catastrophe to aquatic lives, however, 10 respondents with 20% said catastrophe usually expose organism from

their aquatic habitat especially flood and pollution and 29 respondents said that most of the catastrophic events destroy aquatic organisms.

Table 13: Question 9: What are the possible measures to save aquatic environment?

Measures	No of Responses	Percentage
Law enacting	12	24%
Public enlighten	19	38%
Avoidance of refuse damp	08	16%
Construction of reservoir	11	22%
Total	50	100%

The table representing the responses on the possible measures to solve problems affecting aquatic habitats, 12 respondents with 24% said government should enact laws on polluting aquatic environment and 19 carried out to make public aware of the danger of polluting aquatic environment. While 8 respondents that represent 16% insist on avoidance of refuse disposal in the aquatic habitats, finally 11 respondent with 22% said reservoir should be constructed.

Findings

It is absolutely right that the findings in an answer to any research project thus the problems and prospects of aquatic lives in Hadejia dam include the following facts

1. Un expected flood of the dam which carry and expose the aquatic lives to a long distance
2. Drying up of water bodies or reservoir that limits the activities of the organism
3. Wide variety of choices for adaptation in aquatic environment are impossible, this is because most of the python zooplanktons live in the fresh water of the area but few of them prefer estuary and salty environment
4. Both zoo and phytoplankton of the area posses special adaptive features which enable them to carry out live activities in dam
5. Turbidity of the water bodies reduces the penetration of oxygen and carbon dioxide which effect both python and zooplankton in population growth
6. Laws enacted by the government of water conservations enable the organism to multiply and grow within a given period of time.
7. The contemporal recognition given to the aquatic environment enable the productivity and population maximization fall drastically.
8. Population which is the subject of discussion apparently every where does not influence the growth and productivity of the dam as pollutants temper with the lives of aquatic environment
9. Lack of inspection and advice from the agencies concerned limited the success of organisms in the water bodies
10. Weeding and deforestation of water plants do not help the growth of organism in the dam
11. Enutrophication, this plays a negligible role in causing the death of algae in the dam. The decomposition of algae by bacteria which use oxygen in their cellular respiration, consequently, affecting aquatic lives in the dam
12. Use of technical and scientific equipment and adequate staffing of the agency enable the dam to be well managed and checked for maximum growth of any species.
13. It is apparent that plants are producers, they primarily produce before both primarily and secondary consumers. Hence forth and the ecosystem of the dam is to be stable for maximum growth and productivity of aquatic lives of the dam. The bad practice of fishing chemicals for maximization of catch, bad habit of the people toward introduction of toxic and waste products into the dam must to be reduced if not totally stopped.

Conclusion

The work was concluded by outlining the following facts:-

- There are number of organisms both plants and animals living in Hadejia dam such as fish, toad, frog, microscopic organism, crab, jelly fish, diatoms algae etc.
- Pollution is the major problem threatening the life of aquatic organism.
- Sewage, eutrophication, chemical contamination of water, agricultural chemicals and waste products, and oil are the major pollutants harming aquatic habitats.
- Eutrophication causes oxygen reduction in the water leading to suffocation and stress to aquatic life.
- The problem of pollution is persistent issue since creation of the dam in the area

- For a concrete solution, there must be a collaborated effort between government, farmers and public as these will enhance proper growth of the aquatic life.

Recommendation

The following recommendation were offered based on the conclusion of the work:-

- It is agreed that water pollution is the most serious problem encountered by aquatic organisms, therefore government should organize, design and plan ways to overcome it.
- To make lives in dam habitable, people should avoid damping of refuse into the water bodies.
- Penalities should be made to any caught disposing harmful materials into the water bodies.
- Enlighten campaign should occasionally be conducted, so that people should be aware of the danger of pollution on aquatic organisms.
- Agencies such as JARDA, FADAMA should equally take part in mobilizing public and awareness against the use of pollutants on water bodies.

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