



## Intercontinental Geoinformation Days

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### Mapping of federal government dams in Nigeria

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#### Keywords

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#### ABSTRACT

This paper focused on the various Federal Government dams in Nigeria, categories, location distribution and capacity. The study observed that the dams, though spread across many states that form the various geo-political zones in the country vary in number, structures, and are not evenly spread. The results obtained from this study showed that more quality dams are needed in the country.

### 1. Introduction

A dam is a structure built across a river or stream to hold back water. People have used different materials to build dams over the centuries. Ancient dam builders used natural materials such as rocks or clay. Modern-day dam builders often use concrete.

Nigeria is blessed with a vast expanse of inland freshwater and brackish ecosystems. Their full extent cannot be accurately stated as it varies with season and from year to year depending on rainfall. These water resources are spread all over the country from the coastal region to the arid zone of the Lake Chad Basin.

In Nigeria like in many other parts of the world, dam projects are often seen as key to economic solution through hydroelectric power supply (Youdeowei, 2019). It equally supports water supply and agricultural purposes. (Oluwayemi, 2012) noted that some of the problems Geographic Information System (GIS) can tackle in a nation include making available ready-made data for infrastructural and facilities distribution and enabling the nation to know her resources, their location and planning towards managing them.

Due to its relevance, some previous works had been done on dams e.g. (Ang et al. 2020) developed a framework of dam classification to organize the categories of the hydrology relationship for implementing environmental flows while (Nasrat et al.

2020) worked on classification of dams by their potential hazards and how to prevent future failures.

### 2. Method

The methodology adopted was to collect data from the government ministry in charge (which in this case was the Federal Ministry of Water Resources).

A geodatabase was created with these data using ArcGIS software. Based on this, our analysis and results were generated.

#### 2.1. The dams data

Data were not readily available so sourcing for it gave a little challenge. The data provided by the Federal Ministry of Water Resources (FMWR) was an excel file which classified the dam data and these classifications were used to carry out the analysis.

It displayed Dam name, Category (size), State, Coordinate, Dam type (Structure), Dam height/Capacity, Purpose, Completion year.

#### 2.2. Database Creation

The Excel data were imported into the ArcGIS environment. Each dam location was plotted. With the attached attributes, querying became easier.

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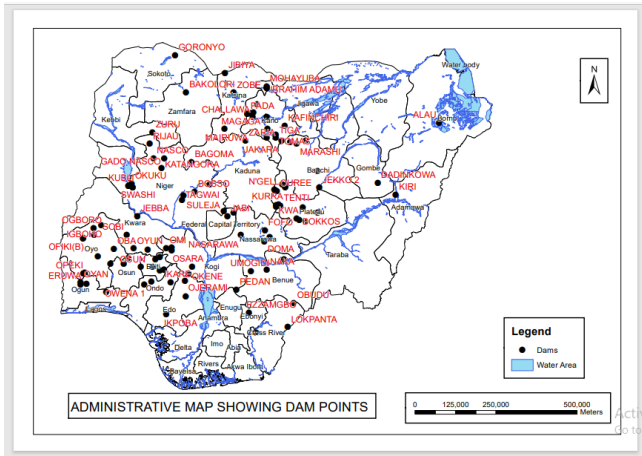


Figure 1. Map of Nigeria showing the dams spread

### 2.2.1. Geopolitical zoning

Nigeria currently consists of 36 states and the Federal Capital Territory. All, based on based on ethnic, cultural and historical ties, and for political reasons are further divided into six geopolitical zones.

Below is a list of the zones in Nigeria.

NORTH CENTRAL- (6 States) Niger, Kogi, Benue, Plateau, Nassarawa, Kwara and FCT.

NORTH EAST- (6 States) Bauchi, Borno, Taraba, Adamawa, Gombe and Yobe.

NORTH WEST- (7 States) Zamfara, Sokoto, Kaduna, Kebbi, Katsina, Kano and Jigawa.

SOUTH EAST- (5 States) Enugu, Imo, Ebonyi, Abia and Anambra.

SOUTH SOUTH – (6 States) Bayelsa, Akwa Ibom, Edo, Rivers, Cross River and Delta.

SOUTH WEST- (6 States) Oyo, Ekiti, Osun, Ondo, Lagos and Ogun.

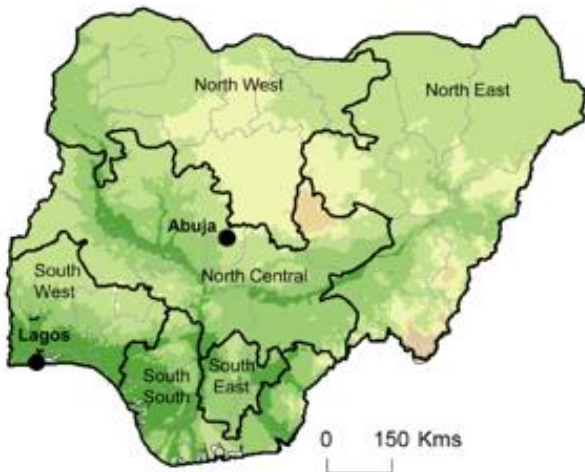


Figure 2. Map of Nigeria showing the six geopolitical zones

### 2.2.2. Dam category (Size)

Based on the available data, the dams were classified as small dams (with heights less than 8.5metres), medium dams (8.5 – 14.9metres), and large dams (15 metres and above).

### 2.2.2. Dam types (Structure)

The dams in Nigeria are classified into their various categories and types according to construction material.

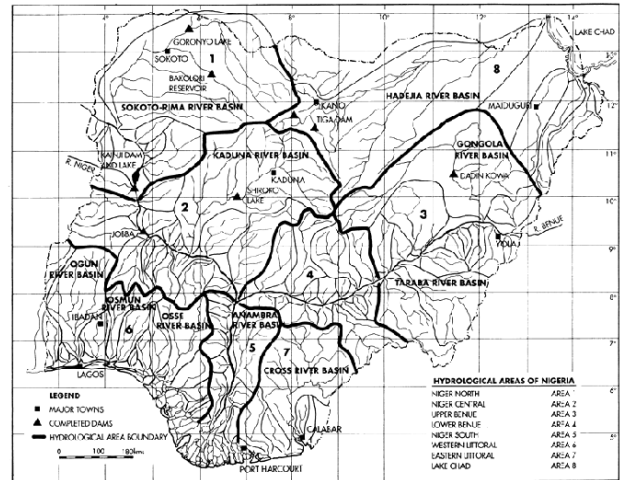


Figure 3. Nigeria hydrological zone

Classification based on construction material brings the Nigerian dam types into earthfill, rockfill, homogenous, zoned and concrete dams.

### 2.2.4. Location based on hydrological zone

Nigeria has about eight (8) different hydrological zones. The dams spread across all these zones.

## 3. Results

The results indicated that although the dams were spread across the different geopolitical zones, their numbers at each varied.

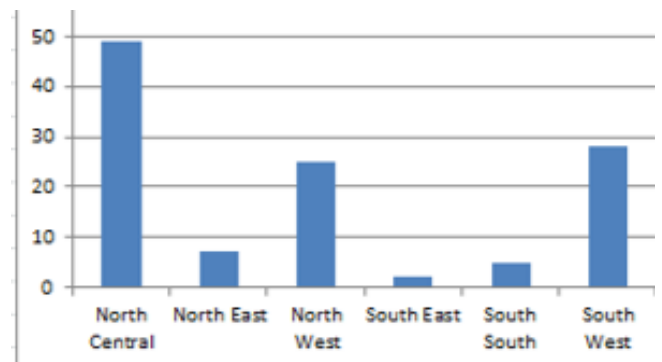


Figure 4. A bar-chart indicating number of dams per geopolitical zone.

The sizes of the dams varied. Using the specifications earlier stated, the dams' classification is indicated in the figure 5.

Majority of the dams in the country are earthfilled type of about 64%, concrete dams are 20%, homogeneous 13%, rockfill type – 4%, while the zoned are around 2% as shown in the following information.

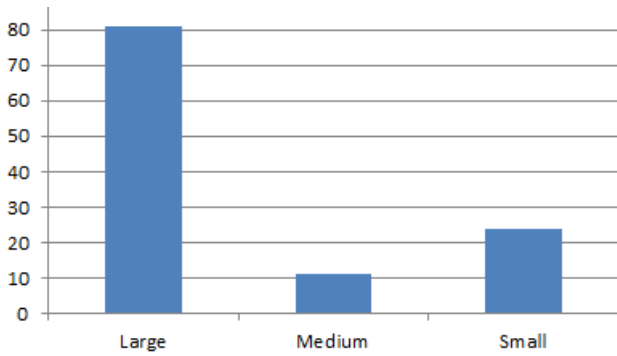


Figure 5. The dams category based on size

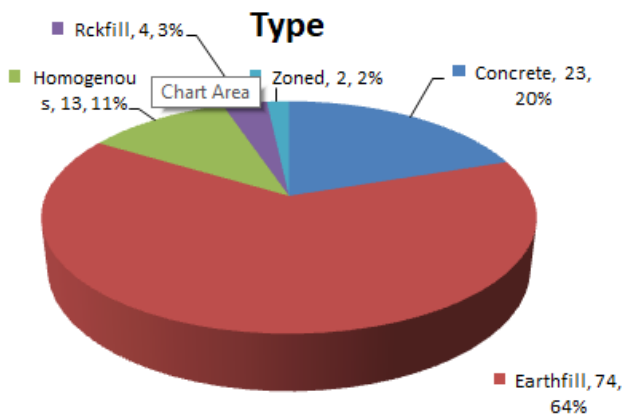


Figure 6. Proportions of the dam structures

The percentage of the dams in each hydrological zone differs and are indicated below.

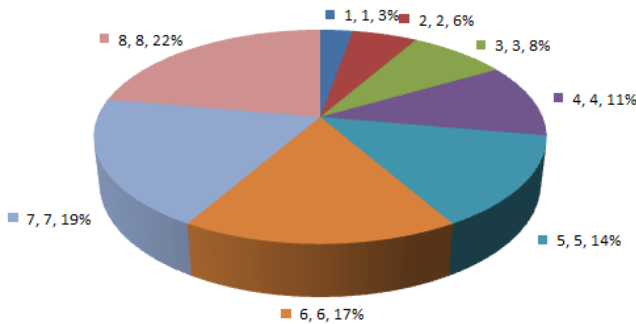


Figure 7. The dams on each hydrological zone

#### 4. Discussion

Although this paper did not investigate the guiding factor(s) in siting the dams, it is however obvious that the federal government dams in the country spread through the parts of the country but did not cover all the states. Different geopolitical zones have varied numbers and the majority are earthfilled.

#### 5. Conclusion

More dams are needed to cover the entire country and to meet the people’s need. The government alone cannot continue to shoulder it and should embrace private participation in the people’s interest.

#### References

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