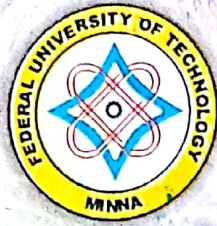
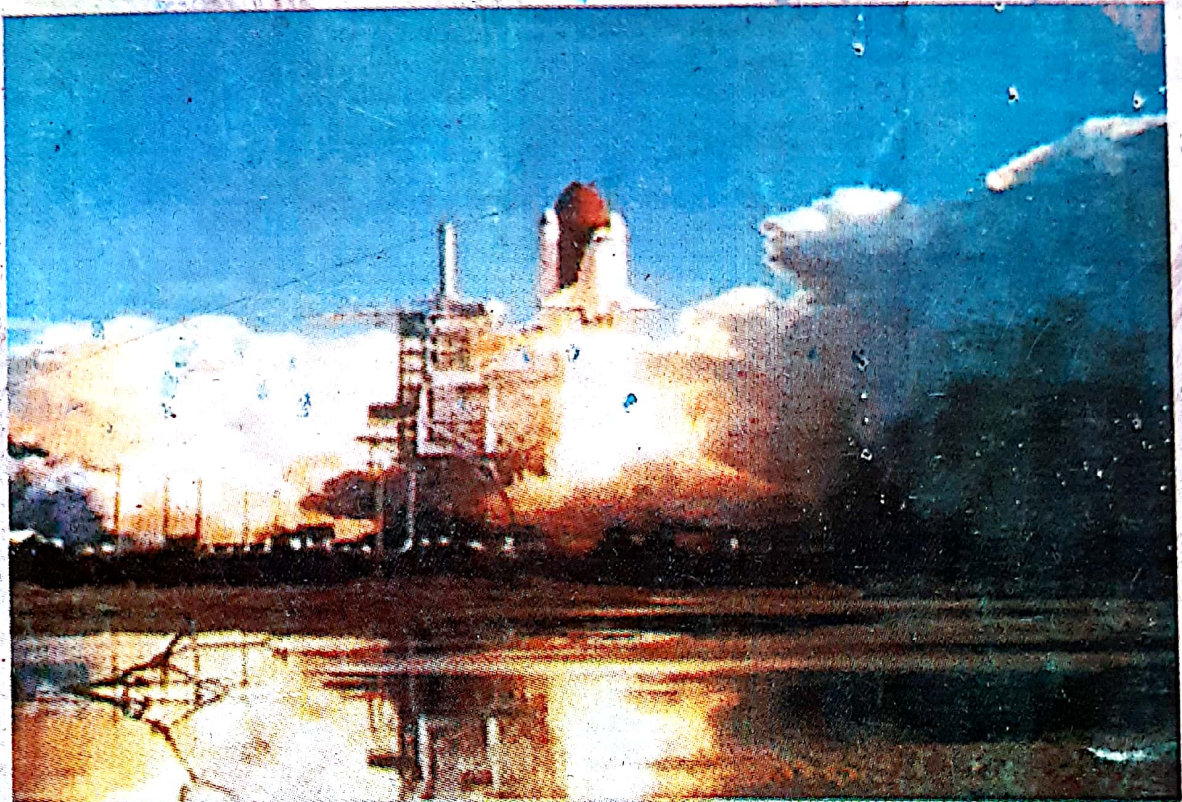


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ANNUAL SCHOOL OF SCIENCE AND SCIENCE EDUCATION CONFERENCE



**FEDERAL UNIVERSITY OF TECHNOLOGY,
MINNA**



BOOK OF READINGS

Theme:
**Challenges in Science and Technological
Advancement and Economic Reforms**

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Abstract

This study is an assessment of the changes, which in the construction of drainage along a natural channel can generate in equilibrium state of the morphological and cascading components of a river system in downstream location. Terrestrial photographs of dry and wet seasons were used during the reconnaissance survey to give visual information of the study area. Two environmental impact were investigated in the study area. The channel cascade system, and the vally side slope process response system. The magnitude of the components of these systems were determined over the period of construction of the drainage along the Bosso River. The result of the investigation show that, in the Bosso River, the drainage and their management by man have modified the channel flow regime by lowering the terrace gully geometry and the channel debris storage.

Introduction

Drainage basin is an important and unique environmental system in which to assess the impact of human management on natural system. For example drainage construction on channel upstream location has great impact on flow regime in the downstream. The discharge in downstream area will induce changes and adjustment in the channel morphological components. According to Mrowka (1994) and Schumm (1994). The impact of downstream includes change in shape, the channel sinuosity, the channel gradient and flood plain.

The draingae basin is a suitable environmental unit in which to pursue the search for quality in land and water. It is a natural system which man, more often than not, manipulate for socio-economic reasons. Generally, man has altered the natural channel directly through the construction of drainage system.

In virtually all aspects that man manipulates the channel basin, the construction of the drainage system has received a considerable attention because drainage construction is a desirable means of solving the problems of flooding and gully-erosion in some parts of Nigeria.

Aim and Objectives of the Study

The aim of this study is to assess the impact of Federal University of Technology Minna channelized drainage system on the downstream channel.

The specific objectives includes:-

- (a) To assess the impact of the channelization of Federal University of Technology, Minna drainage basin on the cascade system of River Bosso doenstream..
- (b) To assess the effect of the channel on the erosion of the cascading system downstream
- (c) To assess the effect of the channelization on the channel morphological debris downstream.

Description of the Study Area

The study area is Bosso drainage system downstream location of Federal University of Technology, Minna which is located in Bosso, Bosso local Government area of Niger state. Niger State is located between latitude 4⁰⁰ and latitude 7⁰⁰ with longitude 8⁰⁰-

11⁰⁰, Niger State lies within the middle belt of Nigeria. Bosso local government area is located on latitude 9⁰30-10⁰⁰ and longitude 6⁰⁰00-6⁰30 respectively. The hydrology of the study area include other rivers such as Malenda Kontogora, Eku, Kaduna, Chanchaga Guwara, Dinga and Arunza river systems, they all drain into Niger river at different points. Most of the rivers are perennial and the volume of their water is controlled by the season and climatic conditions.

The amount of water or rainwater that infiltrates into the ground will depend on the topography, the vegetation cover and human activities like building and construction, also the opening fractures in the weathered rocks allows water to seep into the rocks.

The climate of the study area is discussed based on rainfall and temperature. The annual rainfall amount has been estimated to be between 1,120mm to 1,300mm (Adefalalu 1991). Long hours of sunshine combined with high radiative power across the study area.

The study area is cold/cool to cool/warm zone with cooler sector in the northern half of the study area.

The vegetation type of the study area is mainly the Guinea savannah type. These are marked differences which occur at close intervals with the floristic composition and the open character of the vegetation, which is often caused by variations in soil types topography. The grasses are between 1.5 to 3.5m high. The trees are short, bold, broad leaf trees of up to 16.5m in height.

The soil type of the study area is primarily the result of the interaction between climate, flora and fauna, parent material and geomorphic factors over long period of time. The surface soil are loamy sand or sandy loam. Most of these soils are gravelly except the soils formed on colloidal materials. The subsoil texture is sandy clay, and loam to loam soil type.

Hydrology of River Bosso

River Bosso is located north of Minna municipal area. The river derives its source from Gbako and joins River Hunnun locito, which is a tributary of river Tagwai. It runs from this confluence through the Bosso campus of Federal University of Technology, Minna into the southwestern part of Minna, Bosso River joined river Suka behind Federal University of Technology, Bosso Minna (Campus) and two rivers drain into river Gbako in Niger State.

The part of the river which runs through the Federal University of Technology, Minna, is on the palt form from constructed to ease the drainage in the area

Methodology

The method used in this study are discussed based on the method of analysis described below

As already stated in chapter one, the main approach to the study is the one adopted from Chorley and Kennedy (1971) known as "system approach"

This main focus has largely determined the type of explanation sought in this study. Harvey (1969) based on his suggestion of geomorphologies before him and give types of explanation in geography as cognitive description, morphometric analysis, and cause effect analysis

Data Sources.

The principal data source of the research project are:-

Empirical data gathered in the field by the researcher in the present work of the existing data on the study area downstream location of Federal University of Technology Minna

Reconnaissance Survey

Field observation was embarked upon to give visual information about the study area. The downstream location of Federal University of Technology Minna drainage system. The observation was based on the aim and objective of the research work. The field observation was conducted in 2002/2003 dry and wet seasons. The level and extent of land degradation was observed and with had increase to be about 12.77.m which brought about erosion activities along the downstream location of River Bosso. Measurement was taken for both width and depth in the downstream location.

Terrestrial photographs were taken during the wet dry months. Human activities along the channel where highlighted especially farming during the dry season period. This has resulted in the destruction of the vegetation along the flood plain of River Bosso.

Discussion of Results

Base on the observed from the study area most of the loads carried through the upstream channel are deposited along the downstream location which is hampered by low discharge velocity; erosion and channel cascading. Though the upstream was channeined and protected, the ecological inbalance created by concretization has not been considered in the downstream. Because of the shift in human activities from the upstream to the downstream the pressure on the stream downward has been increased because of the channeized upstream at Federal University of Technlogy Minna, drainage system, therefore, the velocity of flow has inturn been increased to carry most particles downstream. The end of the channelized drainage is characterized by depositional activities. The first part of the load that is dropped consists of boulders and pebbles while the last part that is of fine sediment, called silt materials rarely remain for long at the place where it was first deposited. It is constantly being deposited in the wet season, picked up again and transported to another part of the bed where it is again deposited.

Summary

To summarized, channel deterioration includes bed aggradation, bed scour, bank erosion, increased rate of meander migration and brending. Such changes are not due to chennelization only, channelization is not the direct cause of the deterioration in channel; the cause is principally the lack of control of the water level. For example, if you construct a weir or a barrage, you will find that you cause aggradation upstream, degradation downstream and bank erosion downstream.

Conclusion

The channelization of the drainage system at Bosso campus has a direct impact on river birds and, where such works are related to land drainage schemes, changes in water status of the catehment and subsequent land use substantially reduces area available to breeding and wintering wetland birds. "Managed" rivers support fewer speciasal lower densities than adjacent natural reach channelization often devastates bank side tree and ground cover though there are few objective studies of such effects. There is increasing awereness of the need for engineering schemes to be more senitives to the importance of the bankside habital. There is an urgent need to document the exceedingly rich vegetation characterizing river bank.

Recommendation

Following the result and conclusion of the research one would want to make the following recommendations,

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1. The downstream should be protected against human activities which endangering the course of the river and ecological species.
2. the refuse dumping and excavation of sand along the river flood plain should be discourage against the occurrence of flood which could be felt much downstream than upstream.
3. The rate of deposition and erosion of the area to be studied, while intensive awareness should be address on the change of the river course.

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