



## Biodiversity and species extinction: impact of human induced activities, past and present in Dutse, Jigawa State, Nigeria

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### ABSTRACT

The study investigates the major challenges that posed greater risk to Biodiversity and the reasons for their extinction. Personal observation was applied as the methodology for the study. Biodiversity in their natural habitats were examined to determine the pattern of connectivity. Additionally, sources, areas, and processes responsible for their migration as well as their contemporary flight and eventual extinction were also observed. Findings indicate that human activities through hunting, deforestation brought about by urbanization, global climate change and noise pollution are generally believed to be responsible for biodiversity and species extinction. It has been observed that greater percentage of the population rely solely on car, trucks and motorbike as a means of transportation in the study area and these has contributed significantly to CO<sub>2</sub> emission and thus adds to the impact of climate change which the species could not coped with. The study further found that some villages such as Fanisau, Dalori, near Warwade north of Sakwaya passing through Zobiya has been largely affected by pest infestation which attacked farmlands and destroyed crops during this year raining season and probable appearance of new species has been envisaged in the near future. However, it is not known whether proper conservation practice alone will reduce the migration and eventual extinction to

ecologically acceptable level. The study recommends that appropriate and lasting planning instrument is required to channel the practice of restoration and conservation of biodiversity.

**Key words:** Biodiversity, climate change, human impact, species extinction.

## 1. INTRODUCTION

Biodiversity extinction has been one of the foremost global issues in this contemporary period. Many species are under a very serious threat mainly due to the impact of global climate change and further accentuated by human induced impact. This creates the need for action to be taking to protect their habitats and eventual loss.

Therefore, to avert the aforementioned problems, many developed countries such as the United Kingdom, Germany, and the United States of America have come up with biodiversity action plans to forestall and restore the integrity of species. In fact, the European Union (EU) proposed biodiversity action plan aimed at restoring the integrity of species. This also portrayed the extent and interest attached to biodiversity and the role they have been playing.

Geneletti (2003) observes that the overall goal for protection of biodiversity is to preserve pre- settlement and nature of ecological units in exact ratio to their earlier quantity in the area. Ngugi, Johnson, and McDonald (2010) argued that removal and alteration of natural woodland for farm animals' production and agricultural purposes have a long history and effect on biodiversity loss and environmental injuries. Similarly, Edman, Angelstam, Mikunsinski, Roberge, and Sikora (2011) reported that safeguarding of biodiversity entails science based protection target as well as planned and prepared techniques to maintain the integrity of species.

In a related development, Geneletti (2003) observes that the lessening of habitat is presently deemed to be the major threat to protection of biodiversity globally. Transportation, road and rail networks in particular are greatly responsible to the decrease in both the amount and quality of natural habitat. Likewise, Declerk, Chazdon, Hull, Milder, Finegan, Salinas, Imbach, Canet, and Ramos, (2010) argued that if species population on diverse territory intermingle, this relation is expected to be distance dependent, leading to spatially external effects.

Recent trends suggest that key approaches to biodiversity over the years have attracted the attention of scholars such as Alessa, Kliskey, and Brow (2008) who studied social-ecological hotspots mapping; Boyd, and Banzhaf, (2007), ecosystem services; Evink, Garrett, and Zeigler (1999) whose study concentrated on wild life ecology and transportation; Hess, and King, (2002) Planning open spaces for wild life; Southerland, (1995), conserving biodiversity in high way development project; Seiler, and Eriksson' (1995) study concentrated on new approaches for ecological consideration in Swedish Road planning. Wide range of techniques, such as related taxonomy method, Biodiversity impact Assessment, GIS application, Ecosystem rarity, Ecosystem evaluation have also been explored.

Little or no research has been conducted on Biodiversity and species extinction in the study area. Lack of in depth knowledge on conservation practice and its application as well as insufficient ecological information on biodiversity is the main reason for paucity of research. Therefore, this study aims at investigating biodiversity and species extinction in Dutse Local Government area of Jigawa State through qualitative approach.

## 2. THE STUDY AREA

Dutse in Jigawa State, Nigeria is located between  $11^{\circ}\text{N}$ - $13^{\circ}$  and  $8^{\circ}$ - $35^{\circ}\text{E}$ . The nature of the soil is sandy with badland topography in some certain areas which is characterized by undulating terrain. However, different types of rocks predominates the study area with varying degree of resistance to erosion. The northeastern part which is the study location is made up of sedimentary rocks of Chad configuration and the southern part consists of basement complex. Mean temperature is  $27^{\circ}\text{C}$  with maximum rainfall of about 1000-1200mm and the rainfall usually start around June and end early October (National Bureau of statistics 2012).

## 3. MATERIALS AND METHODS

The study adopted the use of observation method for data collection. The researcher personally observed the status of biodiversity in their natural habitats past, present and the major challenges that posed a very serious threat to species and reasons for the extinction. The observation took place over a long period of time.

## 4. RESULTS AND DISCUSSION

The findings of the study revealed that over the last three decades the study area support huge proportion of biodiversity such as birds; squirrel, of particular concern is the dominance of rare ape. This species, instinctively herd themselves in moving columns mainly for defensive purposes, water and food. Lack of conservation practices makes the species vulnerable to the impact of human induces activities through hunting and deforestation.

Furthermore, these factors habitually threatened their survival to a very large extent and virtually resulted to a significant reduction in their population. Similarly, major observed habitats in the study area include trees, buildings, rocks and forest plantation, but unfortunately it has been massively fragmented through human impact on the environment only a minute portion of the forest plantation and rocks still remain apparent.

Over the last thirty five years, presence of abundant forest plantation covering a broad area from Yadi settlement stretching to Gadadin village via Kachi and Tago was evident. This forest plantation therefore, served as habitats to many species of flora and fauna and an important corridor through which they connect to other habitats thus, adding to the capacity of local movement; but unfortunately these forests were heavily destroyed as a result of human activities mainly due to urban growth.

Declerk, *et al.* (2010) found a similar situation in Meso America where sustaining connectivity is mostly very difficult since the area is inhabited by altitudinal and latitudinal slope which usually caused serious obstacle to species movement.

It has been observed that more than 95% of the landscape has been largely affected by human activities. Many key ecological unit and other habitats were lost in the process and thus resulted to migration and extinction.

Additionally, it is evident that presently hunting declined considerably due to the fact that species ceased to exist over time. From then onward, deforestation brought about by urbanization, global climate change and noise pollution are generally believed to be responsible for biodiversity and species extinction. Many species could not adjust and adapt to the changing circumstances largely due to the aforementioned factors which is in most cases not favorable.

This finding is in consonance with Drechsler, and Hartig's (2010) observation where they noted that if the entire habitats continue to be stable, and, yet if the species are capable to disband between habitats, this spatial re-allocation of habitats is habitually unfavorable for the species.

The study found that over dependence on car, trucks and motorbike in the study area has contributed significantly to CO<sub>2</sub> emission and thus adds to the impact of climate change. An increased in temperature led to a drastic reduction in the population of species as they could not adapt to the impact of climate change and consequently resulted to migration and eventual annihilation. Although, total number of species that migrated could not be precisely establish due to inadequate ecological information.

The incidence of invasive alien species attacked on farmlands and destroyed crops has been observed around Fanisau, Dalori village near Warwade north of Sakwaya via Zobiya villages among others and likely appearance of new species has been envisaged in the near future.

Investigation further revealed that the vegetation is usually susceptible to climate variability through pest infestation, wind damage, human activities through bush clearing and burning for cultivation, hunting as well cattle grazing. Noise pollution has been apparent and found to have an effect on the biodiversity due to movement of heavy trucks during construction of new settlements, industries, schools and roads. This development resulted to destruction of the habitats of both flora and fauna, alteration of animal behavior, premature death and consequently disappearance

The study found that lack of proper knowledge on conservation practice has for long been the bane for species extinction through which an inventory for all species and database could be establish. However, proper management of species require a better understanding of conservation techniques so that effective strategies could be establish aimed at restoring the ecological integrity of the species to their original state.

## 5. CONCLUSION

The findings demonstrate that the study area was initially blessed with abundant species of biodiversity; but unfortunately their survival has been threatened most especially due to human activities and urban growth. It has been observed that presently hunting declined considerably due to the fact that species ceased to exist over time. However, the incidence of invasive alien species attacked on farmlands and destroyed crops have been observed in this year's raining season and probable appearance of new species has been envisaged in the near future. It is evident that currently the vegetation is generally vulnerable to climate variability through pest infestation, wind damage, human activities through bush clearing and burning for cultivation, hunting as well as cattle grazing.

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**Conflict of Interest:** The authors declare that there are no conflicts of interests.

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