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**TERRESTRIAL LAND USE/ COVER MODIFICATION IN THE MULONGWE MICRO-CATCHMENT OF THE LAKE TANGANYIKA BASIN, DEMOCRATIC REPUBLIC OF CONGO (DRC)**

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**Abstract:** *The Mulongwe micro-catchment within the Lake Tanganyika basin in the Democratic Republic of Congo (DRC) has experienced significant terrestrial land use and cover modifications. This study investigates the extent and nature of these alterations through a comprehensive analysis of land use patterns and their impacts on the local environment. The study aims to identify and understand the drivers behind land use modifications, encompassing anthropogenic activities, agricultural practices, deforestation, and urbanization. Furthermore, it explores the ecological implications of these alterations on the region's biodiversity, hydrology, and soil quality. Insights gained from this analysis will contribute to a deeper comprehension of the dynamics between human activities and ecosystem changes in this critical area of the Lake Tanganyika basin.*

**Key words:** Terrestrial Land Use, Land Modification,  
Mulongwe Micro-Catchment

## Introduction

The establishment and management of protected areas form an important and useful element of all national and international strategies for the resources of conservation biological species in the protected areas provide nations with the opportunity to regulator the consumptive usage of plants and wildlife that are careful very important or threatened with extermination due to their uncontrolled practice for existence and business. The growing carbon fluidities into the atmosphere have severally adapted water and energy flows on the earth and people's living (Houghton, 2002, 2003, 2005; IPCC, 2000, 2001). In Democratic Republic of Congo (DRC) as well as in other African countries, there is a scarcity of reliable field measurements of C stocks and fluxes from different environmental systems and their global climate related responses. The massive tropical forest in Democratic Republic of Congo (DRC), tactically situated about the equator, is a key part in local, regional and global fluxes directive. However, the country has experienced periods of variability and poor control fixed with an exponential demographic gravity which could have trigged important land use/ cover and living change with regional and worldwide climatic effects.

Land living use change in Mulongwe micro-catchment is presented in Figure 2 and the summary presented in Table 4. In 1973, the major land use/ cover in the micro-catchment were prairie (50.10 percent) followed by forest (30.33 percent). Other land usage / cover only represented about a fifth of the micro-catchment area and comprised were grassland with dispersed trees, woodland, wetland and constructed up area. In 1986, cultivated land seemed as a new land-use within the catchment, and grassland augmented by about 10 percent, prairie with dispersed trees increased by 13 percent mostly to the expenditure of the forest, all the other land uses continuing almost with the same area analysis. The situation remained almost unaffected up to 1986, period after which forest cover reduced meaningfully and the swamp gone in favor of settlement and grassland. In 2000, grassland augmented by 12 percent and the cultured land disappeared.



Changes in land use/ cover in Mulongwe micro-catchment are due to many factors with demographic gravity and the variability which had hit the country from 1996 to date (2008). Between 1974 and 1986 the main issue of the change in land use/ land cover was the essential to satisfy the request in vitality (charcoal) and food. From Table 4 most of the change in forest took place in this time period and is confused by change in spatial resolution of satellite imagery. The change in land use experiential in 2000 is essentially due to the instability. Throughout that period most of the cultured lands were uncontrolled by farmers because the highlands were more uncertain for them, and could have led to forest regrowth. It is also significant to note that most of the flora around the river has been cleared progressively, and built-up area everywhere the Lake increase also gradually though at a comparatively slow pace. Variation in water levels observed for the last decade has also exaggerated fringing flora. The different land use/land covers of the Democratic Republic of Congo side of the Lake

Tanganyika basin. Carbon density was the highest in the reinforcements of forest, followed by woodlots, cultivated land, grassland with cultivated trees, and the least biomass was observed on degraded grassland. It can also be observed that approximately 50 percent of the carbon is above ground for most of the land uses. Maybe the estimation of the root biomass and so carbon density could have been better if root biomass perfect existed for the region.

The key results of this study comprise:

- Agriculture is the key sources of revenue in the region followed by small trades, and livestock.
- Farming activities have been affected by the instable seasonal calendar.
- Forestry cover has failed and replaced by prairie and cultivated land.
- Greatest of Mulongwe micro-catchment carbon stock was initially (1974) under the forest cover (80 percent).

Land poverty and renovation associated with changes in ecosystem services and functions, and human well-being and good quality of life.

**Poverty:** this idea posits that poverty causes land and ecological degradation which in turn deteriorates poverty. Though there is indication signifying that, in some cases, poverty and poverty are certainly indissolubly related, this is not continually the circumstance. Community, economic, and political institutions at local and national scales can affect procedures and results of the relationship between poverty and degradation. Human safety is damagingly affected by land degradation, particularly in cases where degradation leads to instinctive migration or where it exacerbates the risk of violent conflict. Land degradation is rarely a direct cause of violent conflict and the main cause of involuntary migration; however, it can act as a threat multiplier and increase the probability of both happening.

In populations dependent on dryland pastoralism, a declining resource base driven by land degradation has been shown to be associated with higher rates of violence. Land degradation that reduces livelihood opportunities can drive involuntary migration; further reducing quality of life. Human health is affected in many ways by land degradation, including by an increasing burden of infectious disease (especially vector-borne diseases like malaria), an increase in unsafe drinking water as pollutants are released and the purifying services from forests and wetlands are lost, and a loss of future potential to find new pharmaceuticals. The loss of biodiversity may have a permanent cost to human wellbeing, as the benefit it provides through the thinning of infectious disease appearance is lost. Temporary health costs of development projects may be overshadowed by improved access to healthcare in the long term, but health burdens, as with many changes in quality of life, will excessively affect poorer sections of society as well as cultural minorities who have less access to quality medicinal care, and benefit less from growth in the long-term.

### **Adaptation to Climate Change**

The adaptive capacity of vulnerability in the forest sector, the additional research and action-oriented plans are needed to be able to measure the possible nature of climate change more exactly in each case, the vulnerability of the forest to these anticipated changes and the most suitable adaptation measures. Appropriate to each case. Several management options are possible to increase the resilience of forest ecosystems, including adaptable silviculture and, in planted forests, sensible selection of species. At the landscape scale, the protection of large areas of forest with internal variations in climate, altitude and soils as well as the development of connecting networks would likely allow internal migration of species, which would reduce their vulnerability to climate change.

The region is addressing vulnerability in the forest sector to climate change in various ways. There is an urgent need to establish National Adaptation Action Programs (NAPA), which include references to the importance of climate change.



Impact Of Lost Resources of Biodiversity

### **Achievement Tropical Forestry Plan**

By FAO it is intended to provide a mechanism whereby international Aid efforts could be better to coordinated and coordinate, with a view to halting the destruction of tropical forests and encouraging their maintainable development. The programs seek to do this by helping countries which have tropical forests to develop national forest management strategies by increasing investment in tropical forestry with coordinate assistance of Aid programs from contributor countries. Preservation and management of biodiversity national legislation to provide method for providing the legal protection to species contains in laying down exclusions or restrictions together with penalties for non-compliance. Analysis of wildlife protection legislation in most cases the lists of protected are relatively short, rarely. Numerous activities were been undertaken or coordinated that are designated to mitigate biodiversity loss, which was been involved to assist UNESCO programs and IUCN on the Earth strategy together with UNDP and World Bank namely in the areas mentioned:

- Protecting the ozone layer
- Limiting greenhouse gas emissions
- Protecting biodiversity and protecting international waters.

To preserve specific areas that contribute to products, genetic resources for food production and regulation of climatic and rainfall patters. With access to GEF funds to countries and UNDP programmes between projects that meet GEF mandate and normal development project proposals in developing countries.

- Earth erosion studies need to be conducted in the study area
- Best soil and water management practices need to be identified in the region.
- International policies and instrument to support national approaches to deal with funds which lie outside national boundaries and global management.

### **Conclusion**

Protected areas are reserves that can help repopulate animal and plant species in surrounding areas whose resources have been depleted due to excessive use and that can in some cases generate income for surrounding communities by resorting to non-consumptive uses such as tourism.

### **Reference**

1. UNEP 1992, biodiversity country studies summary. A reality of case implemented to the fifth session Intergovernmental Negotiating committee for a convention on biological diversity by Mc Neely World Resources Institute Washington DC in 1992.