AN ASSESSMENT OF FOREST TREES RESILIENCE TO ELEPHANTS IMPACTS IN RABONGO FOREST, MURCHISON FALLS NATIONAL PARK- UGANDA.

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1.0 BACKGROUND TO THE RESEARCH

The ecology of forest elephants have been known to be characterized by the prominence of fruits in the diet and relatively small family unit that moves together through the forest. In most parts of their range, clearing in the forest provide critical resources for them to access scarce minerals and interact with their families and mates.

Within their range exists savannah forest mosaic such as the savannah ecosystems of east and South Africa. They live by browsing forest vegetation, eating large qualities of fruits whenever available and minerals from water pits or soil deposits (White 1993).
Although suitable browse is probably found in most parts of the forest, fruit trees and mineral deposits are known to influence their season's movements. White (1993) went a head to assert that elephants move to various parts of their range with fruits leaving heaps of droppings of seeds that can germinate later encouraging forest regeneration.

Klaus et al (1998) noted that distribution, patterns and abundance of elephant paths tend to correlate with tropical fruit trees fruiting seasonality and distribution. According to (Turkaso and Fay 2001), unique aspects of most forest elephants are the attraction to clearing in the forest where they seek out minerals and social attractions. The feeding patterns of *loxodonta Africana* is the one that causes forest dynamics in a small forest patch like Rabongo and the extent to which this feeding pattern has contributed to the forest trees, regeneration, recruitment resilience is the interest of this research.

1.2 STATEMENT OF THE PROBLEM

In the 17th century and 18th century, there was still a very low population in sub-Saharan Africa, Uganda inclusive and therefore most of the elephant habitants and home ranges were un tampered with. Elephants could roam freely within their home ranges looking for various diets and impacting less on the ecosystem (Short 1981).

With the increasing human population in the 19th century and early 20$^{th\ t}$ century, most of the protected areas were gazzetted which resulted to driving humans out of such areas. With agricultural expansion most of the elephant corridors and ranges were cultivated or settled

blocking their foraging and/or ranging routes. The elephants which used to roam the whole way from Murchison falls National Park through Budongo, Semiliki Elizabeth and Bwindi National parks could no longer move due to destroyed game corridors. Even those elephants which were left in areas like Nakasongola and other game reserves were Trans- located to Murchison falls National Park. This increased elephant population and reduced their home range. The elephants which used to browse on a wide range of plants else where were now concentrated within Murchison falls National park leading to them concentrating on small nearby forest like Rabongo forest patch in the south eastern part of the park. With limited feeding range, the elephants resorted to destruction and utilization of various parts of the forest trees in Rabongo threatening its further existence that if not checked, will lead to its disappearance and emergency of accompanying environmental hazards. Resilient tree species will then be favored changing the tree species composition of the forest. This research has therefore been designed to assess the impacts of elephants and how the forest trees in Rabongo are coping up with these impacts and further still elephants plays in forest regeneration, recruitment and increment.

1.3 OBJECTIVES

1.3.1 GENERAL OBJECTIVE

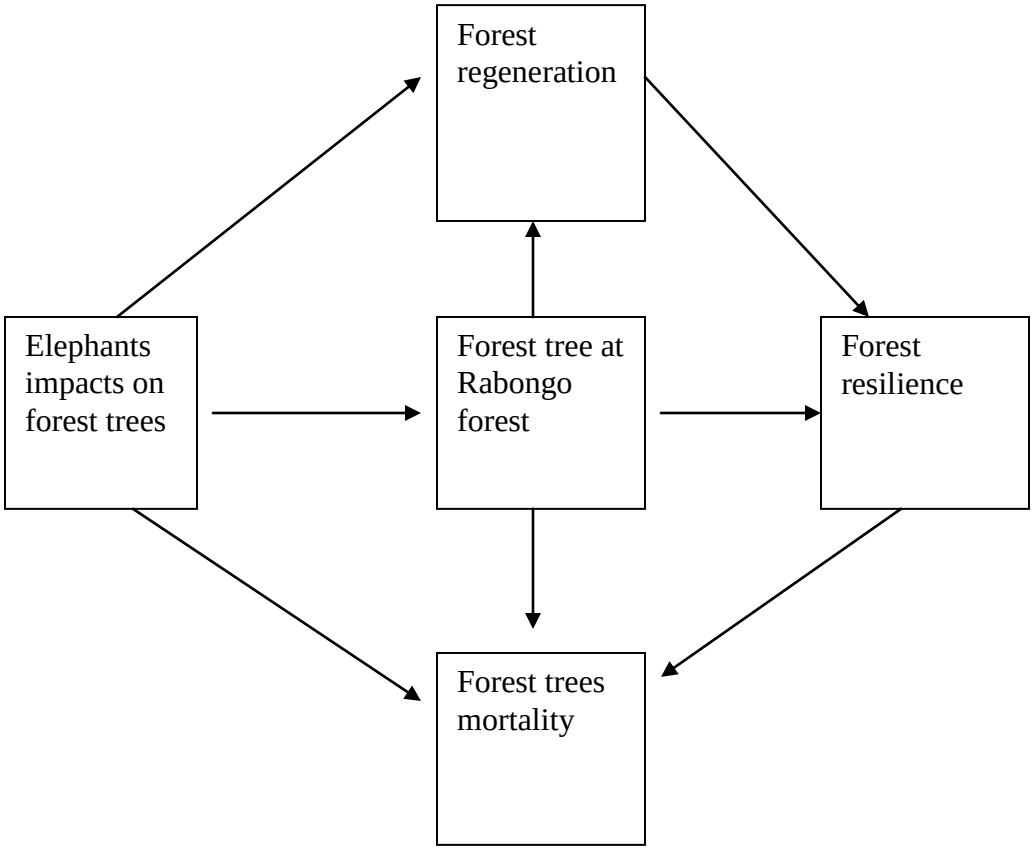
The overall objective is to reassess the impacts of elephants on forest trees in Rabongo and their contribution to forest regeneration, recruitment and increment.

1.3.2 SPECIFIC OBJECTIVE

The study will seek to;

- To reassess the impacts of elephants on forest trees of Rabongo
- To assess the extent of forest regeneration, recruitment and increment in Rabongo forest patch
- To ascertain what coping mechanisms being employed by the forest to be able to recover from the elephant impacts.

1.4 CONCEPTUAL FRAMEWORK OF THE RESEARCH



1.5 BRIEF REVIEW OF RELEVANT LITERATURE

Reasonable efforts have been made to study the interaction of elephants with their habitat both in Africa (Laws 1970: Wing and Buss 1970) and south Asia (Muller- Dombois 1972: Sukumar 1986). It's known that *Loxodonta Africana* causes serious damage to trees like *Acacia spp, Adansonia digitata and Sclerocarya birrea- marula* (Buechner and Dawkins 1961: Barnes *et al* 1994; Tchamba 1995; Gadd 2002).

In its feeding habit, *Loxodonta Africana* impact on trees in various forms which include and may not be limited to breaking stems, striping tree barks, browsing of the trees shoots from standing trees (Buechner and Dawkins 1961, laws et al 1970).

Most of these feeding methods will have varying impacts on tree growth and survival. Breaking of the stem or uprooting trees will automatically lead to their death and in some cases ring barking which will result into infection by pathogens and other pests causing death and drying. Gro Putz and Milton (1995), Schoonernberg et al (2003) in Sheil (2004) asserted that stem damage is known to reduce mean tree life time.

Many researches have been conducted world over to asses the role of elephants in the contribution to forest dynamics (short 1981).

These researches have gone a head to identify the plays of the different elephant species in particular regions in the world in forests' complexity.

Study in Dermakot forest reserve- Malaysia revealed that elephants foraged on shoots of *Macaranga* and damaged forest vegetation causing and maintaining gaps in the forest due to their foraging behavior (Hisashi *et al* 2006).

Johns (1986) appreciated the contribution of elephants in seed disposal by including them into flagship species.

Nampindo (2005) also pointed out that elephants act synergistically with fire in reducing woodland and thicket to grassland by striping the bark of trees exposing them to desiccation and fires. He however concluded that elephants foraging enhance tree diversity and forest regeneration. He went ahead to recommend for monitoring of elephant population and forest ecosystems for possible threats to conservation.

1.6 METHODOLOGY

The study will employ stratified random sampling design due to the need to reassess the earlier on established 7 random samples known as Permanent Sample Plots (PSPs) which were randomly established along predetermined strata.

The study will re-open/establish the 7, 100m X 100m (1 ha) sample plots which will then be subdivided into a 20m X 20m (0.4 ha) 25 quadrants which will be reassessed for extent of damage/scarring, diameter at breast height (DBH), regeneration, recruitment and increment.

Both the qualitative and quantitative research design will be used, the former to establish the extent of forest trees damages by elephant, type of species damaged/ favored to establish numbers of trees affected/ damaged, the number of trees recruited, the number of species

regenerating due to elephant activities in Rabongo forest. The qualitative design will give results in terms of levels whereas quantitative design will give results in terms of numbers.

Qualitative design will further give the most affected tree species and the most favored and reasons why they are favored.

The researcher will analyze data continuously throughout the data collection period. Themes will be established according to the research objectives through which qualitative and data will be analyzed.

Those data with similarities will be identified, merged and analyzed together in relations to the study objectives.

The researcher shall assign scores to parameters relating to a given theme and these scores shall be summarized statistically and presented into frequencies which will later be converted into percentages or degrees which will be used to determine the trend of the findings and thus draw conclusions.

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