



**PLANT AND INSECT COMMUNITY ASSEMBLAGE ALONG A  
HUMAN INDUCED DISTURBANCE GRADIENT IN MIOMBO  
WOODLANDS IN KEMUTAMBA COMMUNAL LANDS, NORTH EAST  
ZIMBABWE.**

**By**

**Nyaradzo Zinyowera Irimai**

**N01521436W**

**A thesis submitted in partial fulfilment of the requirements for the degree of Master of Science in  
Ecotourism and Biodiversity Conservation**

LIBRARY NATIONAL UNIVERSITY OF SCIENCE AND TECHNOLOGY PO BOX 346 BULAWAYO ZIMBABWE		
DATE	ACCESSION	CLASS No
25/03/19	SC 19/1093	

**Department of Forest Resources and Wildlife Management**

**Faculty of Applied Sciences**

**National University of Science and Technology**

**July 2017**



**NUST Library**

## ABSTRACT

Miombo woodlands are rapidly being degraded by anthropogenic disturbances with significant consequences for plants and animal communities. Although studies have shown insect diversity to be sensitive to disturbances and plant diversity, very few studies have been carried out along a human-induced disturbance gradient within the dry miombo in Zimbabwe. In this study, I determined (i) the effect of disturbances on the plant and insect community and (ii) the relationship between the plant community composition and structure and the insect community assemblage along a disturbance gradient in Kemutamba communal area, northeast Zimbabwe from January to March 2017. Therefore, plant structure (height, diameter, canopy cover and basal area) and plant and insect abundance and species composition were measured along a disturbance gradient. One-way ANOVA showed a significant difference in plant community structure with undisturbed areas being dominated by the tree layer and highly disturbed areas with a high shrub density and richness. Plant community composition (i.e., diversity and species richness) did not differ across different levels of disturbance in the tree, shrub and grass layer. Insect species diversity was high in moderately disturbed areas ( $p < 0.05$ ) while richness, density and abundance were not significantly different between sites. Finally, Canonical correspondence analysis (CCA) showed that litter depth and shrub height were the main predictors of insect species richness. Insect density and abundance were associated with shrub diameter and shrub richness, while insect diversity was strongly influenced by tree density and grass species richness. In conclusion, the findings of this study suggest that disturbances within the miombo woodland change the plant community structure rather than plant species richness and diversity. Further disturbance has an impact on insect species diversity, peaking at moderate levels of disturbance. Overall, both plant community structure and composition are strong predictors of the insect community assemblage, and thus to conserve invertebrates within miombo woodlands, there is need to tighten policies that govern woodland utilisation within communal areas.

**Keywords:** Insects, miombo woodland, diversity, disturbance, community composition, communal lands.