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Research Focus

My study of plant ecology examines how crops and related plants interact ecologically with other abiotic and biotic elements of agroecosystems and other habitats, which offer enormous promise for environmentally sustainable crop production. I study the interconnections between species and ecosystems, with particular attention paid to weed and vertebrate pest control, biota conservation for increased crop yield, and climate change mitigation. My research promotes biodiversity preservation in the ecology of arable farmlands (and, when necessary, laboratory assays), conserved areas like national parks and forest reserves, threatened fragile ecosystems (wetlands in urban areas, fire-managed ecosystems, and contaminated areas that hold potential for species conservation, like dumpsites). My research's broader focus includes both protected and unprotected areas in various agroecosystems and vegetation zones in mangrove swamps, rainforests, derived and southern guinea savannas across southwestern, south southern and south eastern Nigeria.

In addition, I focus on assessing the floristic interactions between crops and weeds. In an effort to profile the nature of a particular crop's relationship to weeds for crop production that is both safe and environmentally friendly, I have investigated competitive and allelopathic interactions between crops and other plants. As a result, we discovered that *Acalypha segetalis*' competitive interaction with cowpea was not harmful, and we calculated the critical period of weed interference in okra to be 4 to 8 weeks. *Oxalys subscorpioidea*'s bio-herbicidal and stimulatory effects on maize seed germination and growth parameters were also identified. The acquired information would aid in preventing the agroecosystem from being subjected to pointless chemical herbicide treatments. Consequently, staples like African native vegetables, cowpea, and cereals (maize and rice), which considerably improve food security for resource-poor small-holder farmers in developing nations like Nigeria, can be grown more inexpensively and safely.

My research on the relative ecological significance of crops and other plants in wetlands in Ibadan and Old Oyo National Park, fire-mediated ecosystems at Olokemeji Forest Reserve and Old Oyo National Park, and polluted areas like peri-urban dumpsites are all focused on protecting environmental biodiversity. The results of the investigations showed varied levels of threats to particular species and environments. For instance, we have discovered that the floristic organization of some ecosystems is such that the below-ground and above-ground plants are statistically so disproportionately uncorrelated that they cannot coexist over time. Understanding the biotic and abiotic interactions in these ecosystems has made it possible to suggest appropriate management techniques to use for sustainability.

In fragile protected areas like Old Oyo National Park, where grass diversity has been connected to an abundance of games and the functionality of the Park, floristic assessments of ecologies and phenology of plants are made on a broad ecological scale. Keystone grasses in the core of Old Oyo National Park were discovered; likewise each plot of the IITA-conserved forest in Ibadan had its floristic interactions with other species described. Survey studies in the severely degraded forests of southeast and Niger Delta Nigeria have revealed the community structures of the forests and how human exploitation of trees has continued to affect

the endemic Sclater's guenon in Nigeria, which is listed as an endangered species by the IUCN. The study raised community awareness of the need of protecting forests and the monkey.

Research

a. Completed (Selected)

- i. The Legacy of crop intensification on composition of above ground flora and soil seed bank of Sasa-Ajibode farmlands, Ibadan, Oyo State. Eutrophication of Dandaru reservoir in Ibadan, Nigeria in relation to land-use and mechanical desilting.
- ii. Diversity and phytosociology of herbaceous flora in the wetland area of the University of Ibadan Integrated Fish Farm, Nigeria.
- iii. Determination of correlates of conservation status of *Launaea taraxacifolia* in southwest Nigeria.
- iv. Estimation of Carbon stock and diversity of woody and herbaceous flora in University of Ibadan Forest Reserve in relation to environmental protection.
- v. Influence of *Olox subscorpioidea* on seed germination and growth parameters of maize (*Zea mays* L.) and Okra (*Abeloschu esculentus* (L.) Moench. in southwest Nigeria.
- vi. Diversity and ecological importance of ferns in Oil Palm Plantation, a case study of Nigerian Institute for Oil Palm Research.
- vii. Floristic structure and regeneration potentials of Olokemeji Forest Reserve, South West Nigeria.
- viii. Peri-urban agricultural expansion and forest loss in Moniya, Ibadan, its implication on floristic composition and species invasion.
- ix. Effect of cohabitation of invasive *Celosia trigyna* L. on growth and yield of staple vegetables (Okra, Celosia and Jute mallow) and maize in southwest Nigeria
- x. A Six-year post-desilting ecological state of Dandaru Reservoir in Ibadan, Oyo State, Nigeria

In progress (Selected)

- i. Role of the University of Ibadan Botanical Garden in conservation of vascular plants and arthropods
- ii. Assessment of influence of gap dynamics on low-growing flora and fauna in forest University of Ibadan Teak plantation
- iii. Determination of productivity and critical period of weed interference in Tiger nut cultivation in southwestern Nigeria
- iv. Evaluation of Invasive Attributes of *Euphorbia gramineae* in Ibadan Nigeria
- v. Evaluation of habitat suitability and bioenergy potential of *Bambusa vulgaris* in southern Nigeria
- vi. Assessment of ecological and phylogenetic distribution of *solanum nigrum* in southwest Nigeria