

Title: Diversity and Biomass relationship in forest ecosystems: from political to scientific considerations

- **Date:** December 29th, 2017
- **Hour:** 17h00
- **Venue:** Conference room of LABEF
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Abstract

Biodiversity conservation and climate change are two most debated topics among scientists, managers and policy-makers, manifested by international initiatives such as The Convention on Biological Diversity, The United Nations Framework Convention on Climate Change, The Paris Agreement, etc. In essence, most forest ecosystem functions and services are vital for human beings, yet climate regulation services are particularly relevant with regard to increasing anthropogenic greenhouse gas emissions in the atmosphere and its subsequent adverse effect on climate. On the other hand, conservation of natural forest ecosystems is seen as springboard for reduction of deforestation rate and maintaining biodiversity. With the large greenhouse gas emissions due to industrialization, deforestation and forest degradation, care should be given to management policies aiming to balance the production of food, fibre and fuel while protecting biodiversity and contributing to regulation of global climate change. While it is theoretically acknowledged that clear understanding of the role of these forests in carbon sequestration and climate regulation would support the motives behind biodiversity conservation, analytical evidence is needed as decision support framework. In this presentation, I wish to build from political and scientific considerations to elaborate on the so called "biodiversity-ecosystem function" (BEF) relationship. (1) I will focus on single case of ecosystem function (biomass production, also related to carbon stock and local climate regulation – even if not straightforward); (a) aspects of biomass estimation (destructive, semi-destructive and non-destructive) will be addressed, and with regards to (b) stand- (first phase) and tree- (second phase) sampling, (c) biomass equations, (d) Up-scaling from tree to plot and from plot to stand levels. (2) I will next elaborate on biodiversity components such as taxonomic diversity, structural diversity, functional diversity and dominance. (3) The relationship between carbon storage and biodiversity components will be the final focus. I will present a scrutinized analysis of the effects of taxonomic diversity, functional diversity and functional dominance on biomass and carbon stock, through Structural equation and linear mixed-effects modelling, and testing for niche complementarity and mass-ratio hypotheses in forest ecosystems. (4) I will end the presentation by adding some perspective taste on existing gaps and future compelling research studies in the West African context.

Keywords: Allometry, Climate change, Forestry, Policies, functional traits