

Characterization of managed ecosystems in buffers zones of the DJA Biosphere Reserve: implication for tree domestication and Biodiversity Conservation

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Introduction

Rural populations in forest areas rely heavily on natural resources for their basic needs (Felix et al., 2004). The World Health Organization estimates that 80% of people in developing countries utilize wild plants for health and nutrition, often commercializing these resources for income (Bruschi et al., 2014).

The surge in commercial harvesting for urban markets increases anthropogenic pressure, risking plant scarcity or extinction (Posthouwer et al., 2016). To combat biodiversity loss, states have united in conservation efforts, ratifying the Convention on Biological Diversity, prioritizing protected areas like the Dja Biosphere Reserve (DBR), established in 1982 and recognized by UNESCO in 1987 (Miranda et al., 2016; MINFOF, 2011).

However, access restrictions often marginalize local forest dwellers, impacting their livelihoods. In the DBR, local activities threaten its integrity both peripherally and frequently within the reserve (ECOFAC, 2000).

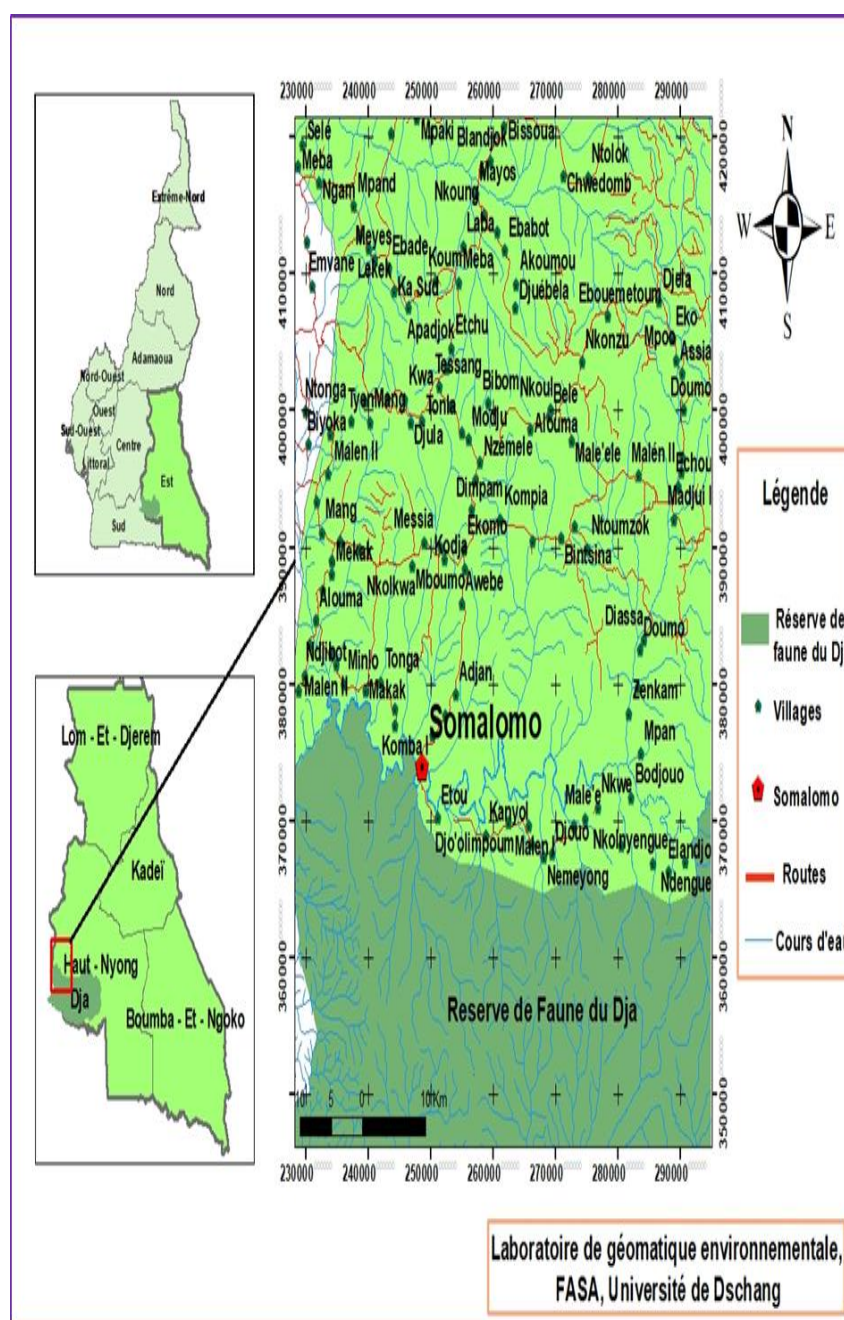
Enhancing the diversity of domesticated trees that yield Non-Timber Forest Products (NTFPs) may alleviate pressure on natural resources and promote poverty reduction and biodiversity conservation (Leakey and Simons, 1998).

Therefore, identifying plant species for domestication that could improve living standards while conserving biodiversity around the Dja biosphere reserve becomes essential.

key research question : Which plants could best improve local living standards and conserve biodiversity on the northern periphery of the Dja Biosphere Reserve?

Methods

2.1 Study Site



2.2 Method

Plots have been realized for the inventory of the forests and the agroforests and also for the description of trees, shrubs and regeneration. Socio-economic and ethnobotanical surveys (using questionnaires) provided information on agroforestry systems established, the level of integration of agroforestry and the different plants used.

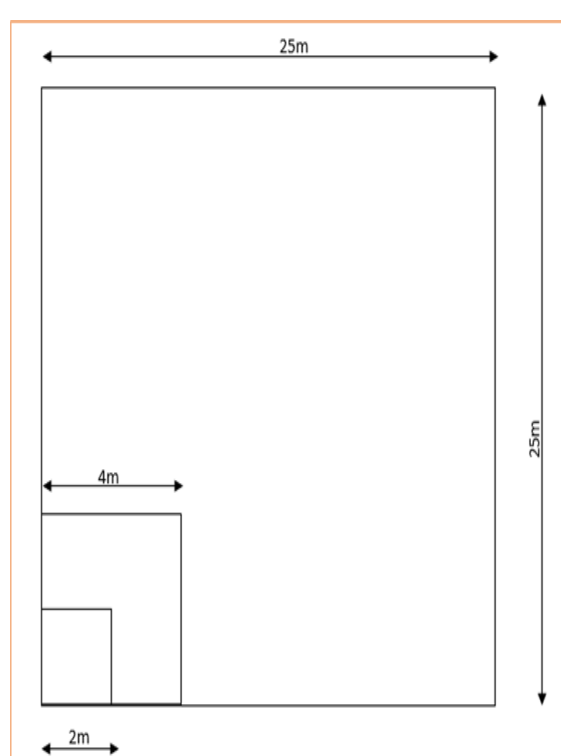


Fig 1: Configuration of the sampling plot for the botanical inventory

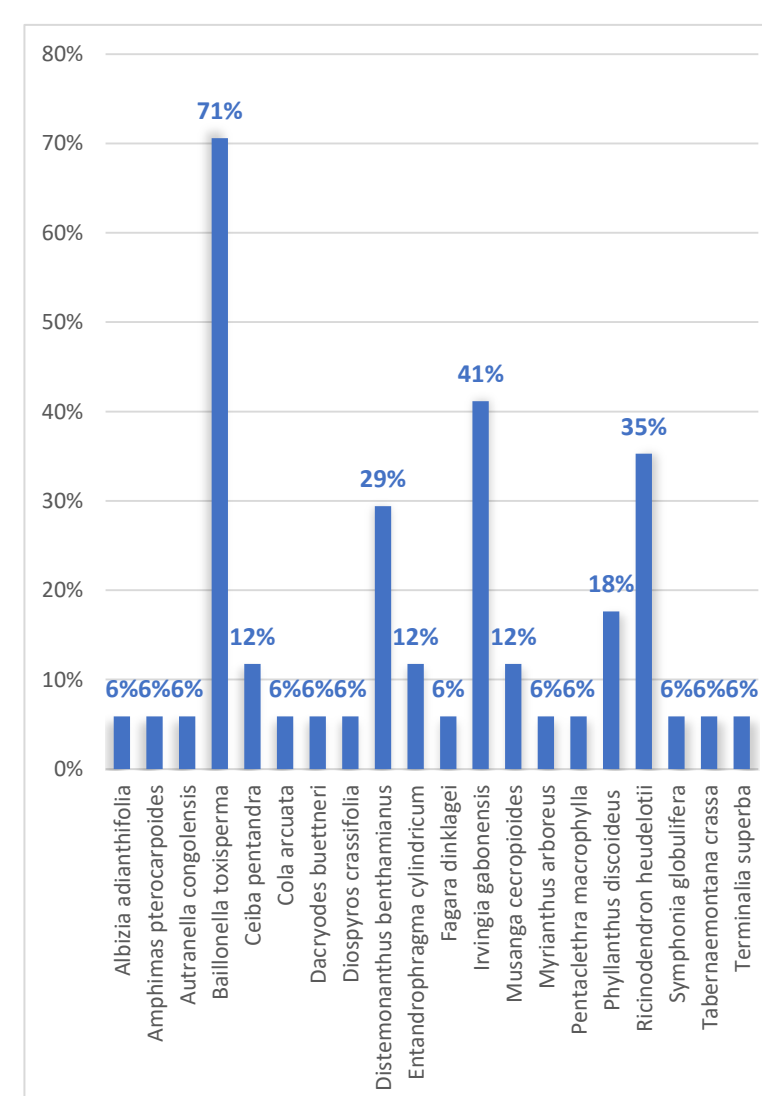


Fig 2: image of a socio-economic and ethnobotanical surveys

Results

3.1 Agroforestry systems used in the study site
Agroforestry systems implemented by these populations are 100% made up of two components: the agricultural component and the forestry component. The pastoral component is absent since they do not practice livestock breeding.

3.2- Forest component



The forest component is composed of trees left behind by the populations when establishing the agroforestry plots, these populations practicing very little domestication.

3.3 Satisfaction with the practice of agroforestry

70% of respondents who believe that agroforestry practices have a positive impact, approximately 64% are not entirely satisfied with its contributions (Somewhat satisfied [35%] and Satisfied [29%]). Added to this percentage are the 24% of respondents who are not at all satisfied with agroforestry practices. This clearly expresses the work that needs to be done to optimize agroforestry systems set up by local populations. This could be done by diversifying the trees present in the plots, thus providing a wide range of goods and services.

3.4 Place of collection of NTFP

Local people harvest the majority of their NTFP in forests with 53% of harvests made only in forests, 41% made in both forests and Agroforests and finally 6% only in Agroforests. This figure shows that the people of Somalomo are still largely dependent on forests for the collection of NTFP necessary for their well-being. Hence the need to diversify the Agroforests set up by local communities, and thus limit their impact on natural forests.

3.5 Perception of the populations of Somalomo on the domestication of NTFPs

Overall, 82% of respondents think that domesticating of NTFPs and integrating them into agroforestry plots would be a good thing; 12% think it would be a bad thing and 6% have no opinion on the issue. Among those who think it would be a good thing, the notions of increasing income, improving production, limiting travel, and reducing dependence on forests were mentioned. Those for whom domestication would be a bad thing argue that it would have no benefit or that the trees placed in the plots would have the effect of delaying production.

3.6 Different uses of plants by local populations

Among the 92 species recorded during these surveys, the majority were used as food plants (with 46% of uses), and medicinal (30%), then came the other uses.

3.7 Priority species whose domestication would contribute to the conservation of biodiversity

According to the priority index (PI), the priority woody species, whose domestication would contribute to the conservation of biodiversity in the study area are the following: *Alstonia boonei* (PI: 72), *Dichapetalum* sp (PI: 68), *Strombosia pustulata* (PI: 68), *Baillonella toxisperma* (PI: 66,68), *Massularia acuminata* (PI: 62).

Conclusion and Outlook

The study aimed to improve the sustainable management of wood resources and the standard of living of populations near the Dja biosphere reserve. The results showed that 94% of households in Somalomo practice agroforestry, with 100% using a complex system based on cocoa. *Baillonella toxisperma* was the most used plant, followed by *Irvingia gabonensis*, *Trichoscypha* sp, and *Alstonia boonei*. The Euphorbiaceae family was also prominent in the forest, with 18 species representing 13% of all identified species.

The main use of these priority species was medicinal. To promote domestication, farmers will be encouraged to protect existing vegetation and invest in new agroforestry systems when they have guaranteed rights to the products, a market for them, and benefit from environmental services produced by their trees.

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