Impacts of perennial plants diversity on carbon stock and bird species in Maradi city, Niger

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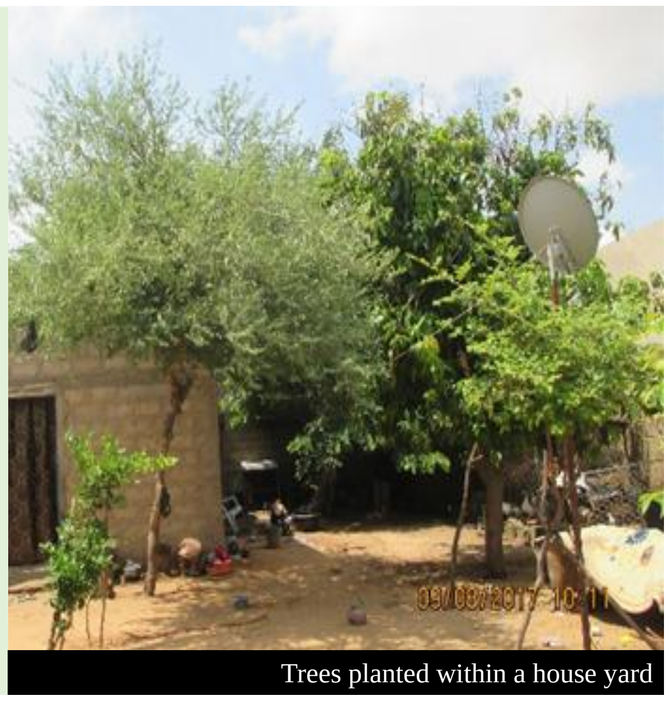
Introduction

- Urbanization is one a key drivers of biodiversity loss which leads to the depletion of natural vegetation incl. carbon storage potentials, reduction of associated species and hence ecosystem services.
- However, urban expansion may also increase urban forest cover (Mockrin et al., 2019) reconstituting habitat for wild animals, incl. birds (Villaseñor et al., 2021).
- Nonetheless, there are regional knowledge gaps in understanding the effects of these changes on carbon stock and bird species diversity in cities of the West African Sahel.
- Therefore, our study assessed residents' perceptions of perennial plants and their effects on carbon storage and bird biodiversity across Maradi, Niger.



Trees planted within a house yard

Materials and Methods

- **Study Sites**: 102 homes plus an additional data set (n = 21) within Maradi city in Niger
- **Data Collection**: Face-to-face interviews, tree inventory, and mensuration (diameter at breast height, tree height), bird species counting (bird point count)
- **Data analysis**: Descriptive and inferential statistics (One-Way ANOVA) and alpha diversity indices were used for woody plants and bird data analysis

Results

- 63 perennial species belonging to 52 genera and 23 botanical families
- Shading was the main reason (54%, $p = 0.027$) for tree planting in the house yards
- *Azadirachta indica* (Neem) was the dominant tree species with highest carbon stock density (13.4 t ha^{-1}, $p \leq 0.001$)
- Ten bird species belonging to 8 families and 10 genera were observed: most dominant: village weaver (*Ploceus cucullatus*, 31%), laughing dove (*Spilopelia senegalensis*, 20%)
- Neem was most visited by birds (9 bird species), followed by *Mangifera indica* (5 bird species)
- Bird species diversity increases with perennial plants richness ($p \leq 0.001$)

Birsds and their nests on tree inside a house yard

Conclusions and recommendations

- Our findings contribute to understanding the ongoing debate concerning the role of urban green space at small scale in urban bird biodiversity conservation and combating climate change.
- The study recommends the use of indigenous perennial species in the residential areas' tree planting programs in Niger.

References

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