

Assessment of the plant resource potential of different land uses within the restored forest landscapes in central Togo

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Introduction

- Plant diversity is a key component in ensuring the long-term resilience of restored forest landscapes (FLR)
- However, measurable ecological outcomes between land-use dynamics, biodiversity, and carbon sequestration remain poorly understood.
- Addressing this gap helps clarify how land use shapes plant diversity and carbon storage



Picture 1. Landscape of an Open Forest



Picture 2. Patch of dense dry forest

Objective:

The objective of the study is to :

- Analyse the floristic diversity of the different land use
- Characterise the forest structure within different land use
- Quantify different land use carbon potential.

Conclusion

- The study highlights that :
- Patches of dense dry forest /gallery forests are critical for biodiversity and carbon storage.
 - Crop/fallow mosaics are priority targets for restoration.
 - Plantations alone are insufficient for FLR goals.
- Prioritize the conservation of dry dense, and gallery forests for carbon storage, implement regrowth planting in savannas, and shift plantation strategies toward species diversification and the promotion of larger tree growth.

Results and Discussion

Floristic diversity

Table 1: Main floristic characteristics of the different land use

	Different land use types				
	Patche of dense dry forest/gallery forest	Open forest/woodland	Mosaic crop/fallow land	Tree and shrub savannah	Plantation
Specific richness	216	190	173	137	67
Genus diversity	173	142	142	108	63
Family diversity	50	45	46	38	27
Order diversity	31	27	30	25	17
Shannon's index	4.51±0.01	4.18±0.01	4.55±0.16	3.82±0.02	1.96±0.02
Pielou's index	0.89±0.01	0.79±0.01	0.88±0.01	0.77±0.01	0.46±0.01

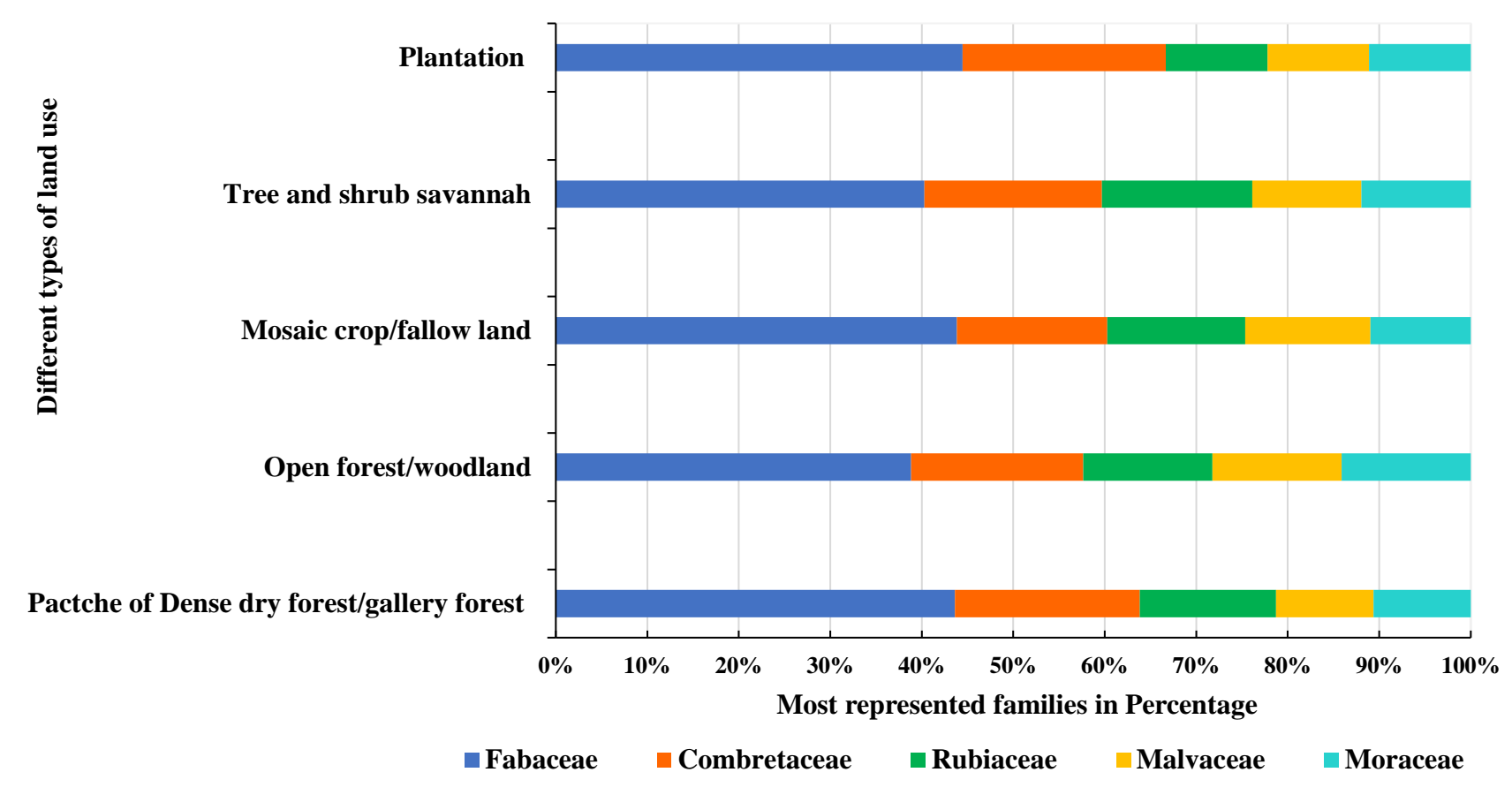


Figure . Distributions of the five most represented families

Forest characteristics

Table 2: Main forestry characteristics of the different land use

	Density (N/ha)	Mean diameter (cm)	Mean height (m)	Lorey	Basal area (m²/ha)
Patche of dense dry forest/gallery forest	206±11.42	24.15±11.8	14.10±6.65		14.04
Open forest/woodland	229±17.40	19.28±16.82	10.22±8.26		8.97
Mosaic crop/fallow land	61±10.29	24.03±22.27	9.97±7.29		5.11
Tree and shrub savanna	252±3.8	18.02±11.21	8.47±5.30		8.75
Plantation	235±3.21	17.80±8.54	9.21±5.95		7.35

Table 3: Estimated biomass and carbon stock in different land use

	Above-ground biomass (t/ha)	Below-ground biomass (t/ha)	Herbaceous biomass (t/ha)	Total biomass (t/ha)	Carbon stock (t/ha)
Open forest/woodland	7.34±0.01	2.02±0.001	0.010±0.001	9.36±0.02	4.68±0.01
Patche of dense dry forest/gallery forest	17.26±0.11	4.74±0.03	0.006±0.001	22.01±0.14	11.09±0.07
Mosaic crop/ fallow land	4.05±0.10	1.11±0.02	0.008±0.001	5.16±0.02	2.58±0.06
Plantation	4.21±0.01	1.15±0.001	0.003±0.001	5.37±0.02	2.68±0.01
Tree and shrub savanna	6.31±0.02	1.73±0.001	0.007±0.001	8.04±0.03	4.02±0.01
Total	39.17±0.22	10.75±0.05	0.0364±0.001	49.96±0.24	25.05±0.16

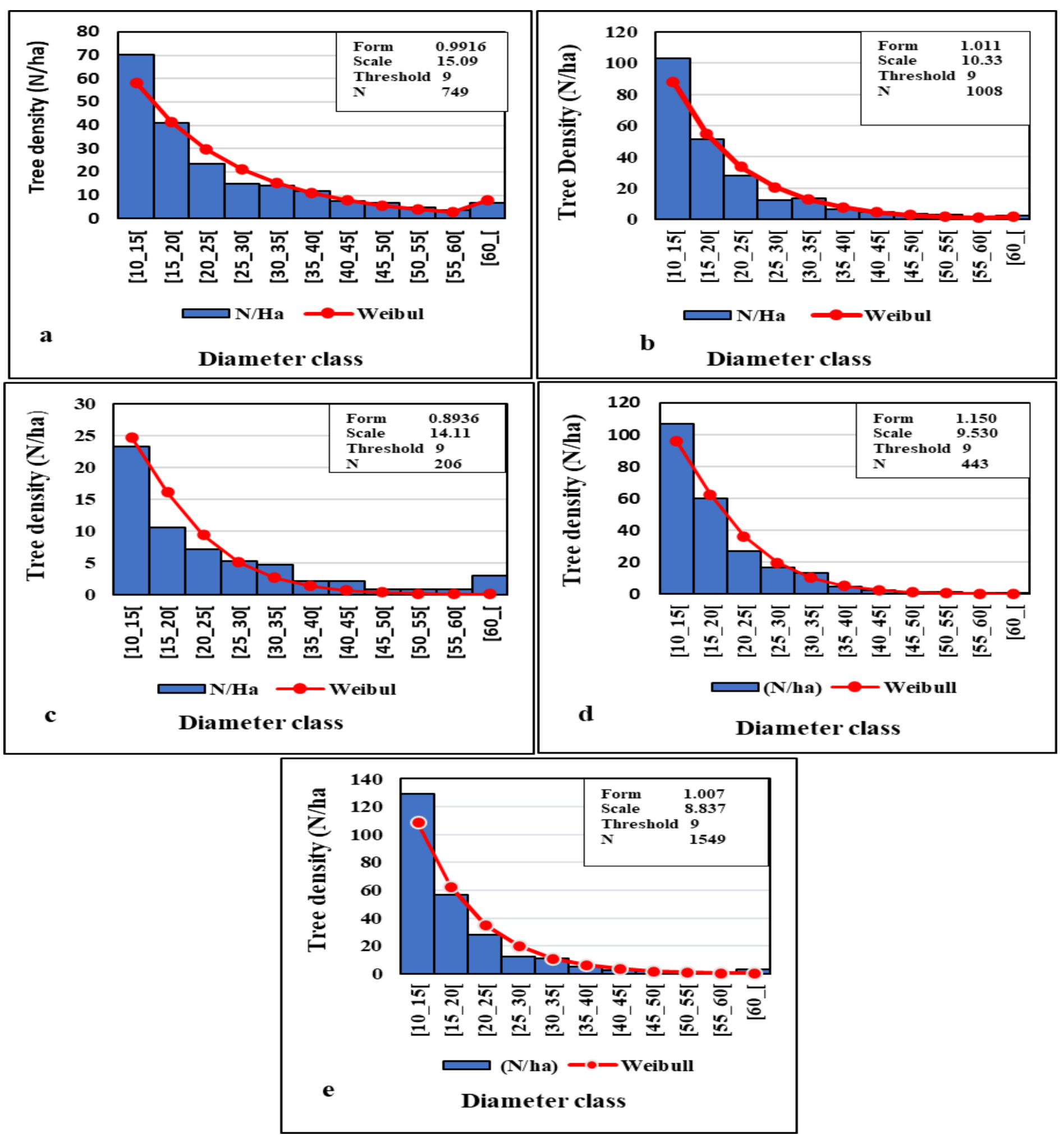


Figure 3 : Diametric structure of the woody stand

Material and Methods

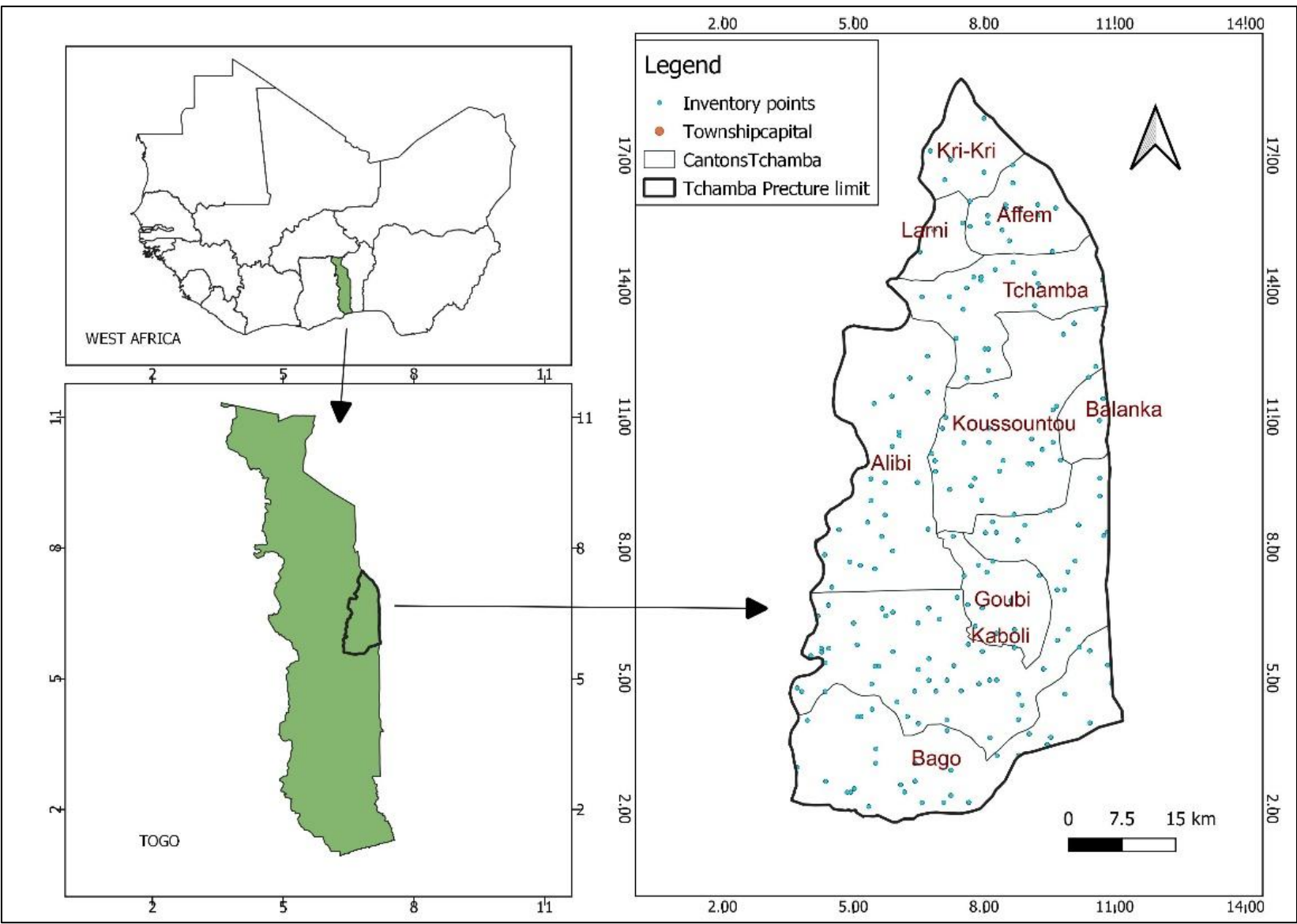


Figure 1. Location of the study area

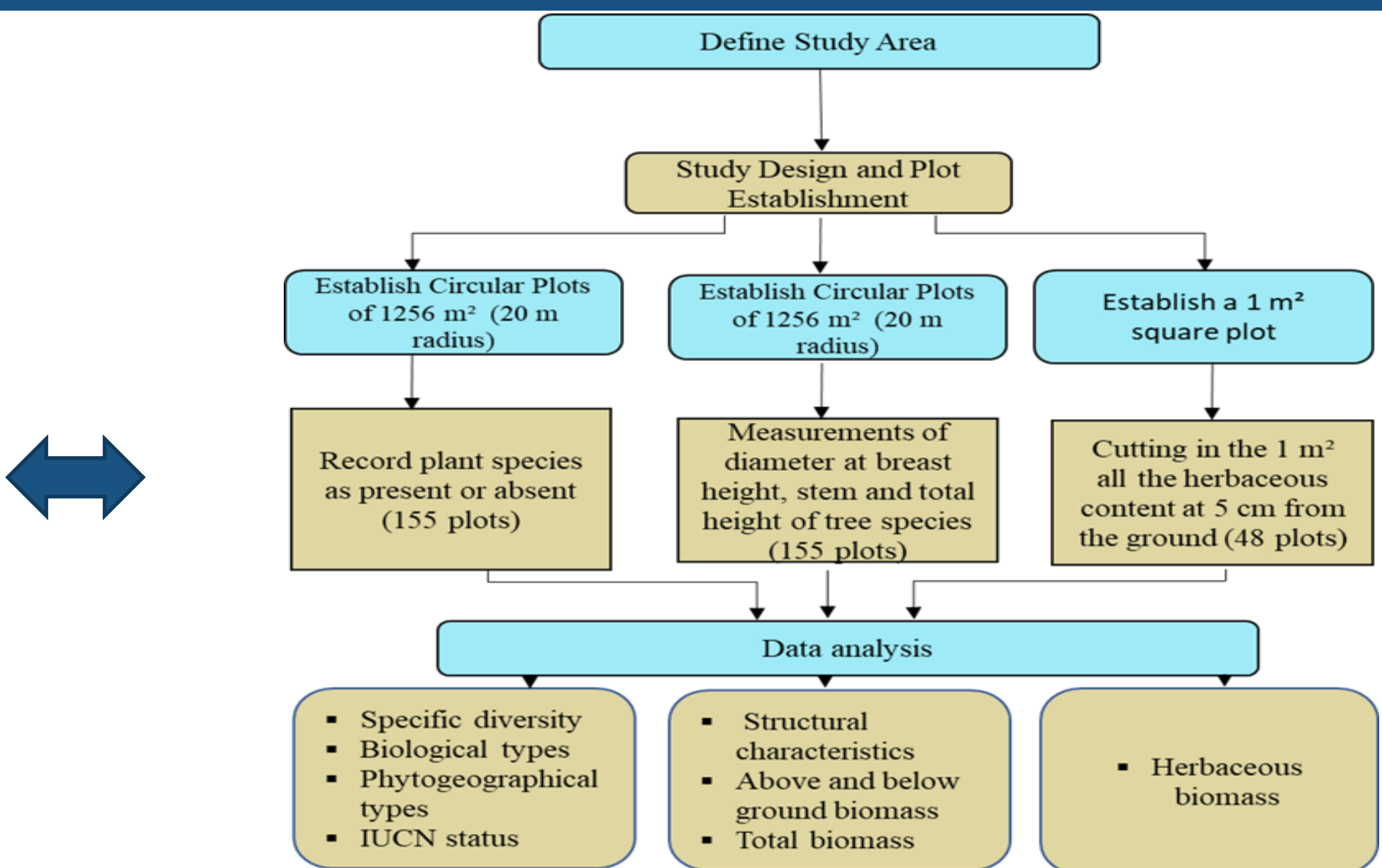


Figure 2. Workflow



Picture 3. Plot after Herbaceous harvesting