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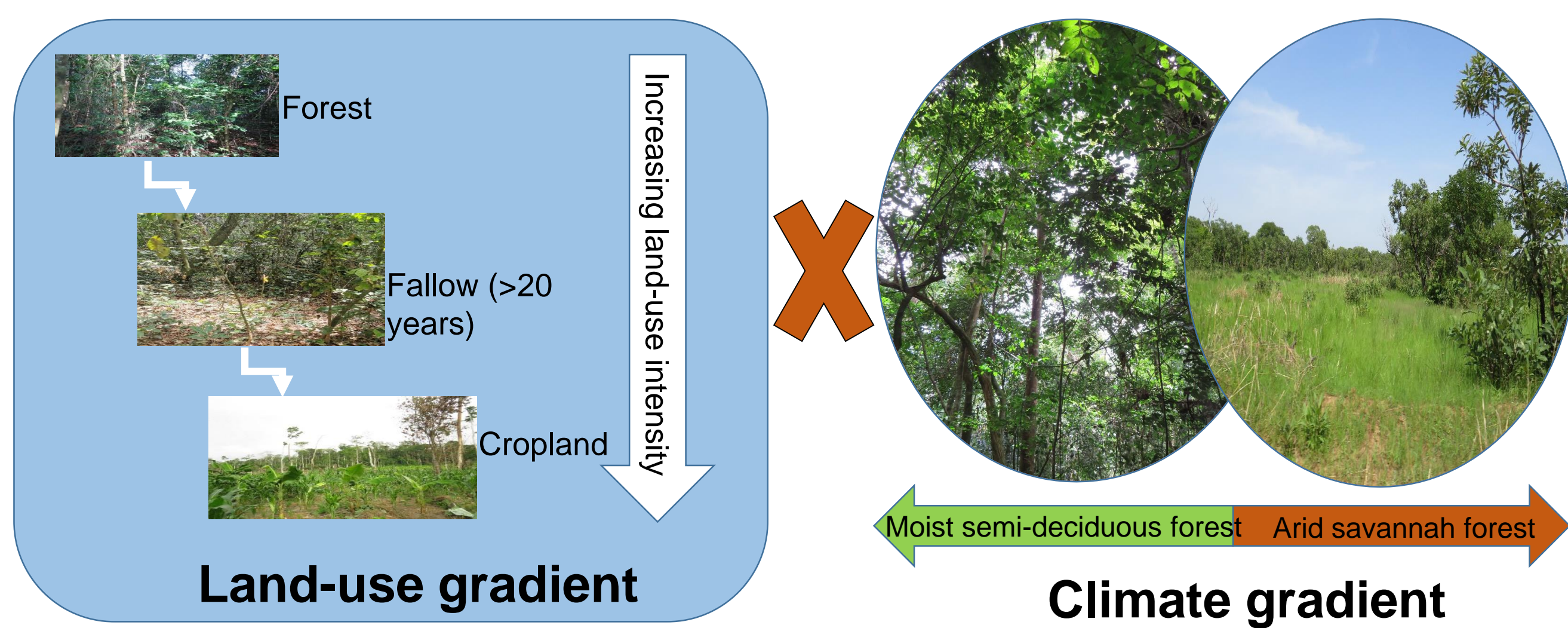
## 1. Introduction

- ❖ Among the major drivers of biodiversity loss in terrestrial ecosystems are Land-use change and Climate change
- ❖ In addition, human-induced pressures in the last century is exacerbating the impact of these processes [1].
- ❖ Understanding the interactive effect of land use and climate change on vegetation and plant communities is of high importance to the study region for current and future management efforts.

## 2. Research questions

- ❖ Does woody species **structure** significantly differ along land-use and climatic gradients?
- ❖ Does land use and climate change have a significant influence on the **diversity (Taxonomic)** of woody species?
- ❖ Does climate have a significant influence on the functional diversity of woody species?

## 3. Methodology



**Study design:** Sampling plots of size 1000m<sup>2</sup> (50 m x 20 m) were established in the protected areas while those in croplands and fallows had a size of 2500m<sup>2</sup> (50 m x 50 m). Each land use type had ten replicates and vegetation data was collected in a total of 60 plots.

Data collected	Parameters measured	Calculated Parameters
Taxonomic identification		Structural composition: Size class distribution
Leaves*	Leaf area, Specific leaf area, Leaf dry matter content	Taxonomic diversity: Shannon diversity, Species richness, Pielou's evenness
Diameter at breast height (dbh)		Functional diversity: Community weighted means of traits, Functional divergence
Tree height		
Wood cores*	Specific wood density*	
Life stage (Adult/Juvenile/Sapling)		
	Bark thickness*	

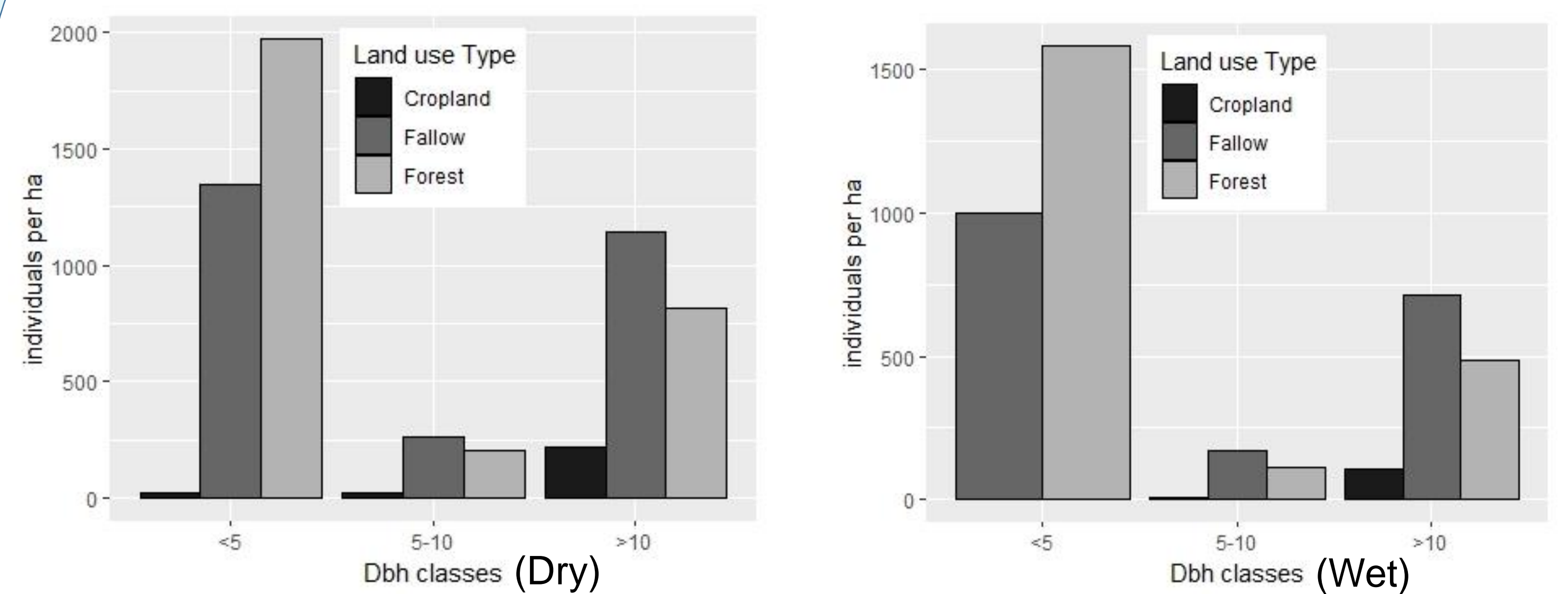
\*Dominant tree species for each climate zone

## 5. Conclusion

- ❖ Differences in structural composition exist within the different Land-use types.
- ❖ Further statistical test is however required to ascertain if climate has an effect on structural diversity.
- ❖ Land-use and Climate both play an observable role on taxonomic diversity.
- ❖ Functional traits – (in particular, tree bark thickness) differ between the two climate zones.

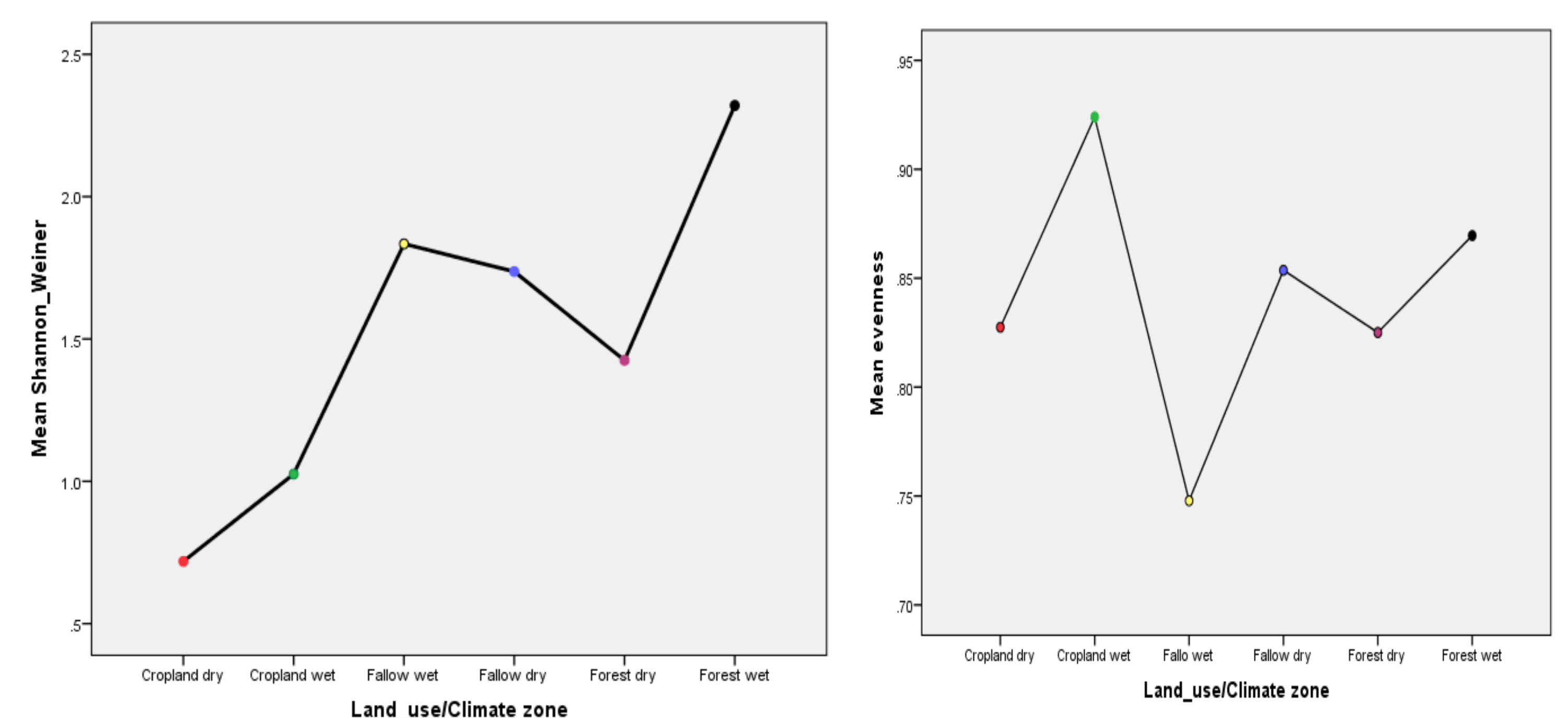
## 4. Results

### 1. Structural diversity



**Fig 1:** stem diameter distributions in land-use types of cropland, fallow and forest for wet and dry climate zones

### 2. Taxonomic diversity



**Fig 2:** Shannon values of all land-use types across the wet and dry climate zones

**Fig 3:** Species richness values of all land-use types across the wet and dry climate zones

## 6. References

1. Sala, O.E., Chapin, F.S., Armesto, J.J., Berlow, E., Bloomfield, J., Dirzo, R. et al. (2000). Global biodiversity scenarios for the year 2100. *Science*, 287, 1770–1774.