Africa's woodlands in transition: Effects of climate change, land-use change on carbon pools

James Ofori[1*], Amanuel Gebremichael[1], Larissa Raatz[1], Anja Linstädter[1]

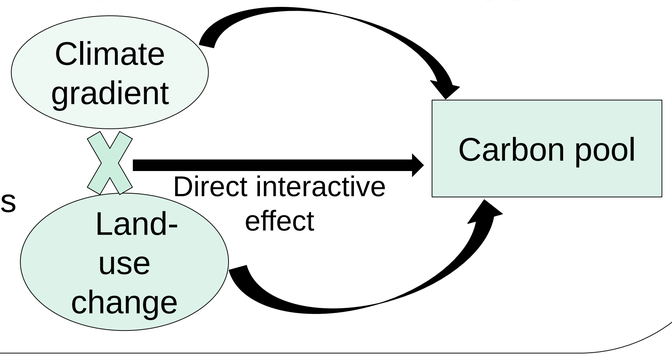
1.Institute of Biochemistry and Biology, University of Potsdam, Biodiversity Research / Systematic Botany

Introduction

Africa's woodland ecosystems:

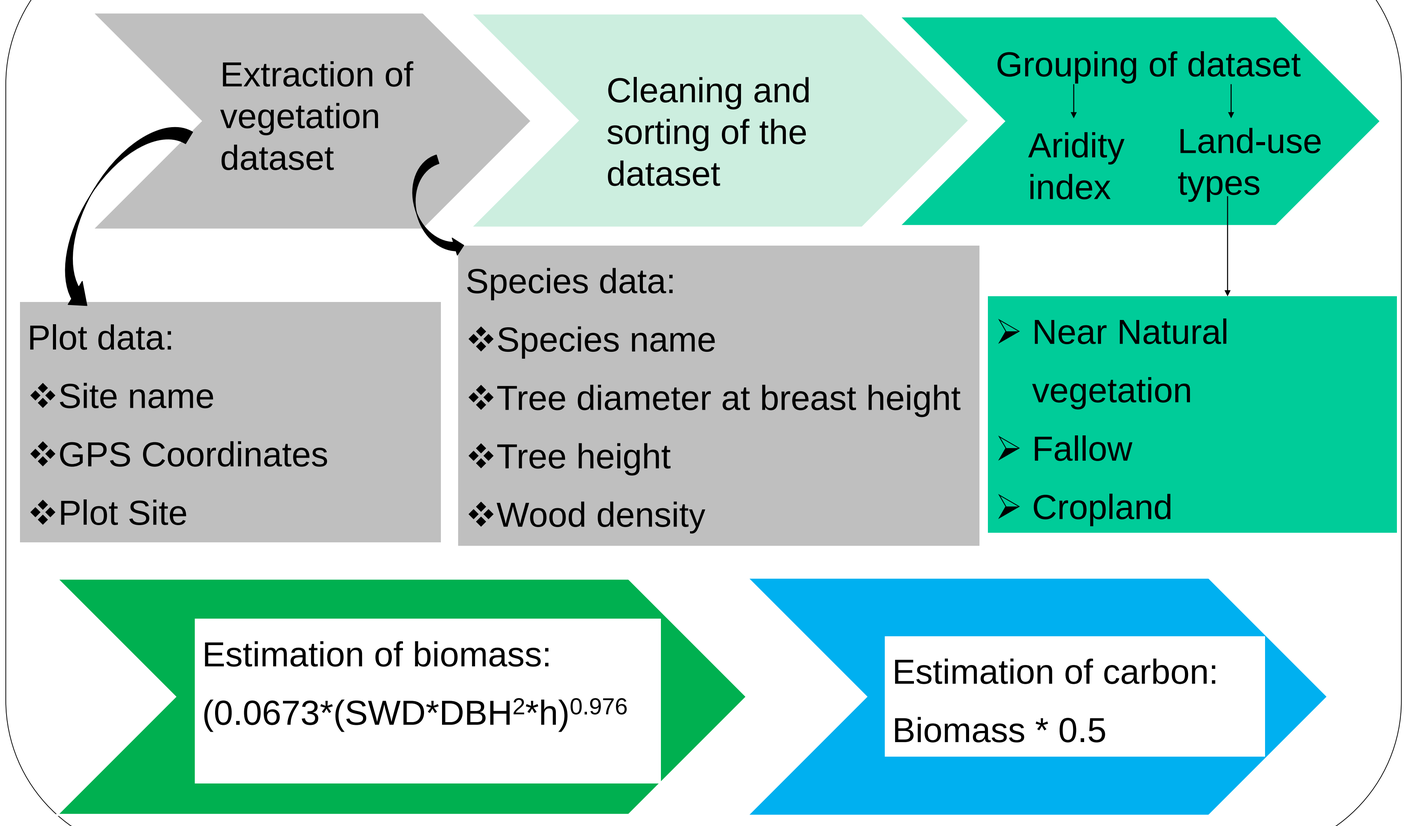
- extend across 34 countries in the Sub-Saharan climate zone
- they represent the dominant vegetation type in these countries [1]
- play a crucial role in carbon pool dynamics [2]
- are currently experiencing a rapid transition caused by two main drivers: **climate change and land-use intensification**

➔ direct negative consequences for carbon pools [3]

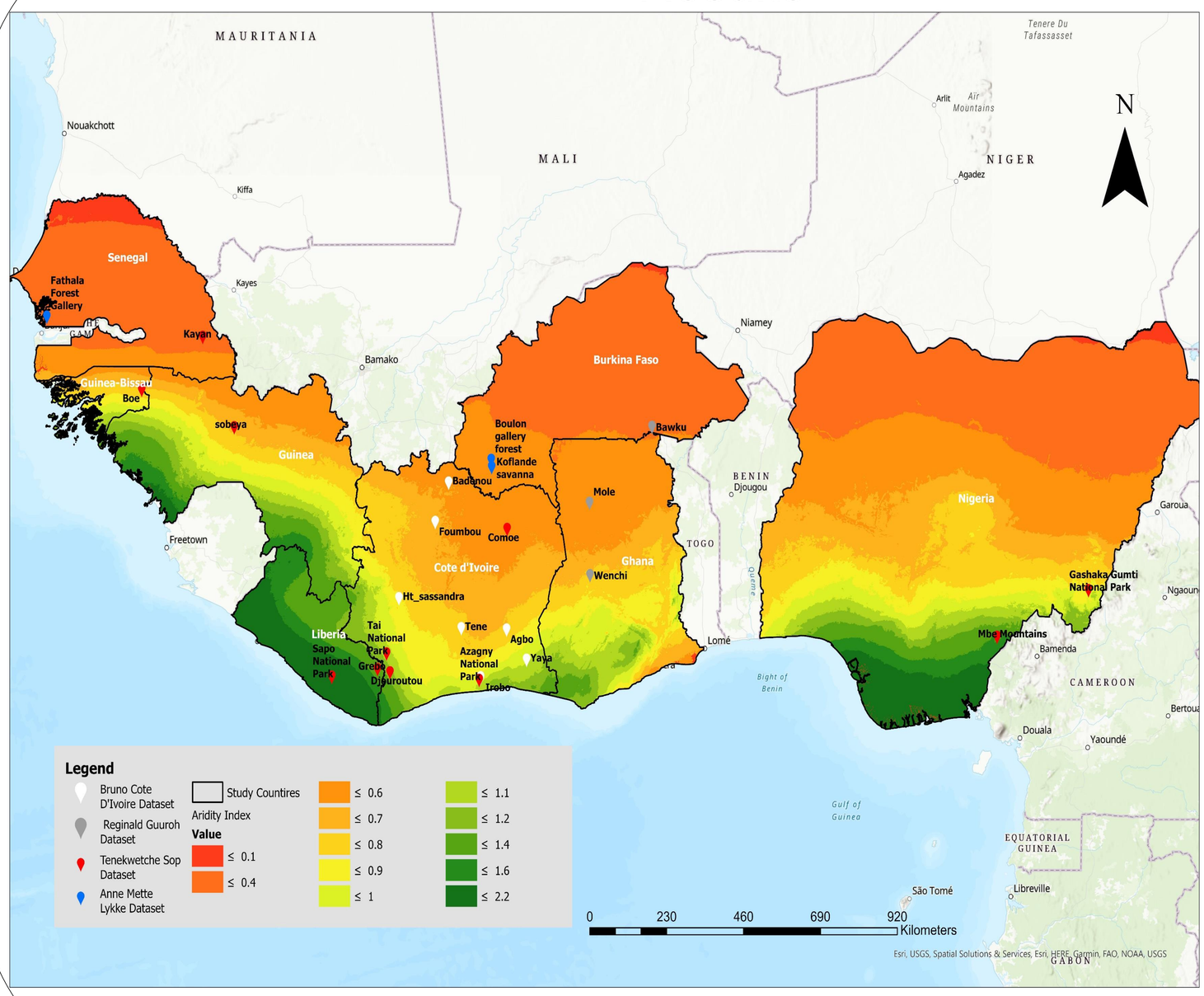


Objective ➔ Assess

Method



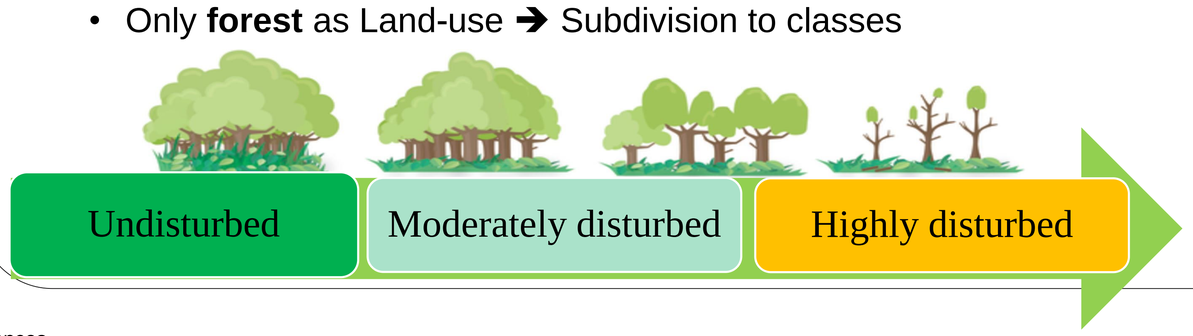
Results



Name	Country	Site	Individual aridity index	Range of Aridity index	Number of observations
Tenekwetche Sop	Senegal	Kayan	0.37	≤ 0.4	3591
Anne Mette Lykke	Senegal	Fathala Forest Gallery/Savanna	0.32		
Reginald Guuroh	Ghana	Bawku	0.38		
Tenekwetche Sop	Cote D'Ivoire	Comoe	0.53	≤ 0.6	13287
Reginald Guuroh	Ghana	Mole	0.52		
Anne Mette Lykke	Burkina Faso	Boulon gallery forest/savanna	0.51		
Anne Mette Lykke	Burkina Faso	Koflande Forest/Savaana	0.52		
Bruno Herault	Cote D'Ivoire	Badenou	0.59		
Bruno Herault	Cote D'Ivoire	Foumbou	0.64	≤ 0.7	3918
Tenekwetche Sop	Guinea Bissau	Boe	0.79	≤ 0.8	33020
Tenekwetche Sop	Guinea	sobeya	0.73		
Reginald Guuroh	Ghana	Wenchi	0.76		
Bruno Herault	Cote D'Ivoire	Agbo	0.76		
Bruno Herault	Cote D'Ivoire	Tene	0.72		
Tenekwetche Sop	Nigeria	Gashaka Gumti National Park	0.87	≤ 0.9	6737
Bruno Herault	Cote D'Ivoire	Ht_sassandra	0.82		
Tenekwetche Sop	Cote D'Ivoire	Tai National Park	1.09	≤ 1.1	17400
Bruno Herault	Cote D'Ivoire	Yaya	1.03		
Bruno Herault	Cote D' Ivoire	Irobo	1.03		
Tenekwetche Sop	Cote D'Ivoire	Azagny National Park	1.04		
Tenekwetche Sop	Cote D'Ivoire	Djouroutou	1.18	≤ 1.2	2351
Tenekwetche Sop	Liberia	Grebo	1.30	≤ 1.4	2715
Tenekwetche Sop	Nigeria	Mbe Mountains	1.54	≤ 1.6	1356
Tenekwetche Sop	Liberia	Sapo National Park	2.22	≤ 2.3	2330

Gaps and Way forward

- Few low arid dataset ➔ Niger, Burkina
- Only **forest** as Land-use ➔ Subdivision to classes



Conclusion

- ➢ Estimation of Biomass and carbon
- ➢ Data analysis
- ➢ Differences in carbon pool dynamics between different climate zones and land use types
- ➢ Usefulness of existing dataset

References

1.Chidumayo, E., & Marunda, C. (2010). Dry forests and woodlands in sub-Saharan Africa: Context and challenges. In The Dry Forests and Woodlands of Africa (pp. 14-22). Routledge

2.Gibbs, H. K., Brown, S., Niles, J. O., & Foley, J. A. (2007). Monitoring and estimating tropical forest carbon stocks: making REDD a reality. Environmental research letters, 2(4), 045023

3.Davidson, E. A., de Araújo, A. C., Artaxo, P., Balch, J. K., Brown, I. F., Bustamante, M. M., & Wofsy, S. C. (2012). The Amazon basin in transition. Nature, 481(7381), 321-328