Charcoal, carbon emissions, and international conventions/protocols

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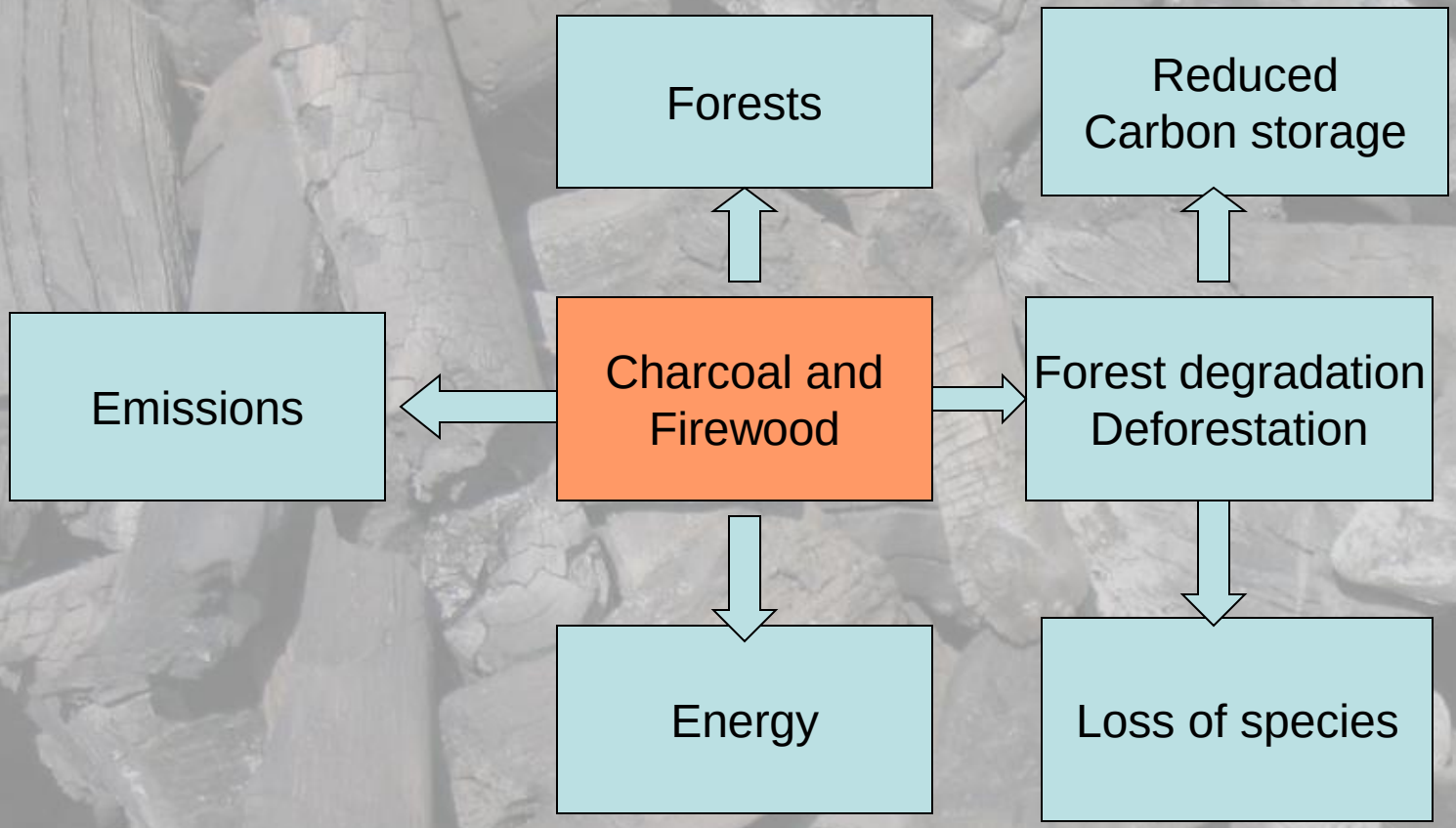
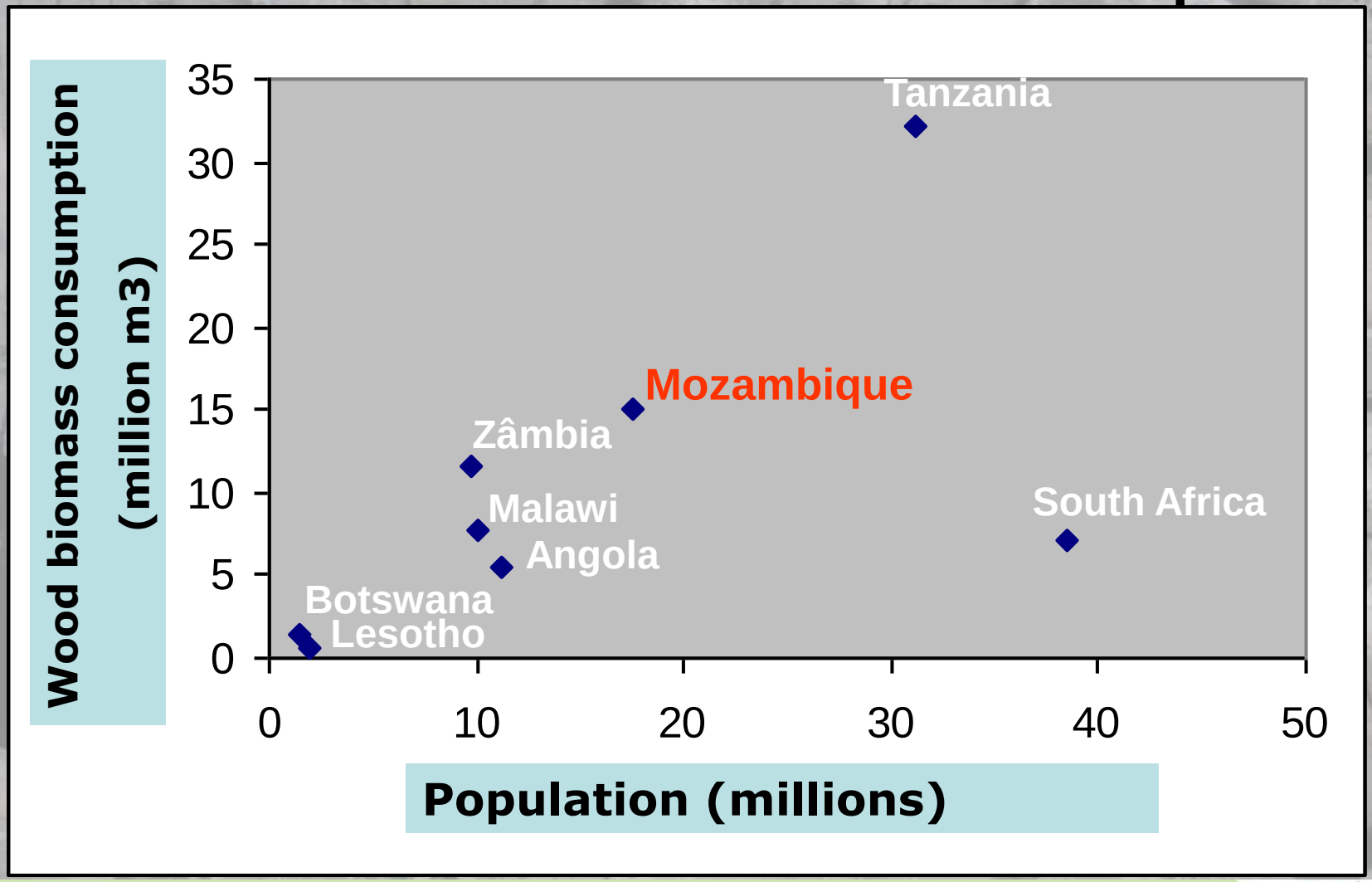
Overview/Outline



Charcoal/Firewood consumption



Emission rates (g/kg dry matter)

	CO2	CO	CH4	NOx
Fuelwood	1500	70	4.5	1.0
Charcoal (making)	1593	254	39	0.073
Charcoal (combustion)	2740	230	8	3.9

More: Carbon Emission Factors (tC/TJ)

Gasoline	18.9
Natural gas	15.3
Solid biomass	29.9
Diesel	20.2
LPG	17.2

CO_2 emissions in Fuelwood

1 m-stere = 290 kg dry matter

435,000 gCO_2

CO_2 emissions in Charcoal

15% efficiency

1 charcoal bag = 45 kg dry matter

71,685 gCO_2

123,300 gCO_2

194,985 gCO_2

Emissions from biofuel combustion in Africa (Tg/year)

	CO_2	CO	CH4	NOx
Fuelwood	433	21	1.33	0.30
Charcoal	27	2	0.08	0.04
Crop residue	56	4	0.22	0.03
Dung	11	1	0.03	0.03
Total	527	28	1.66	0.4

Note: 1 Teragram = 10^{12} grams

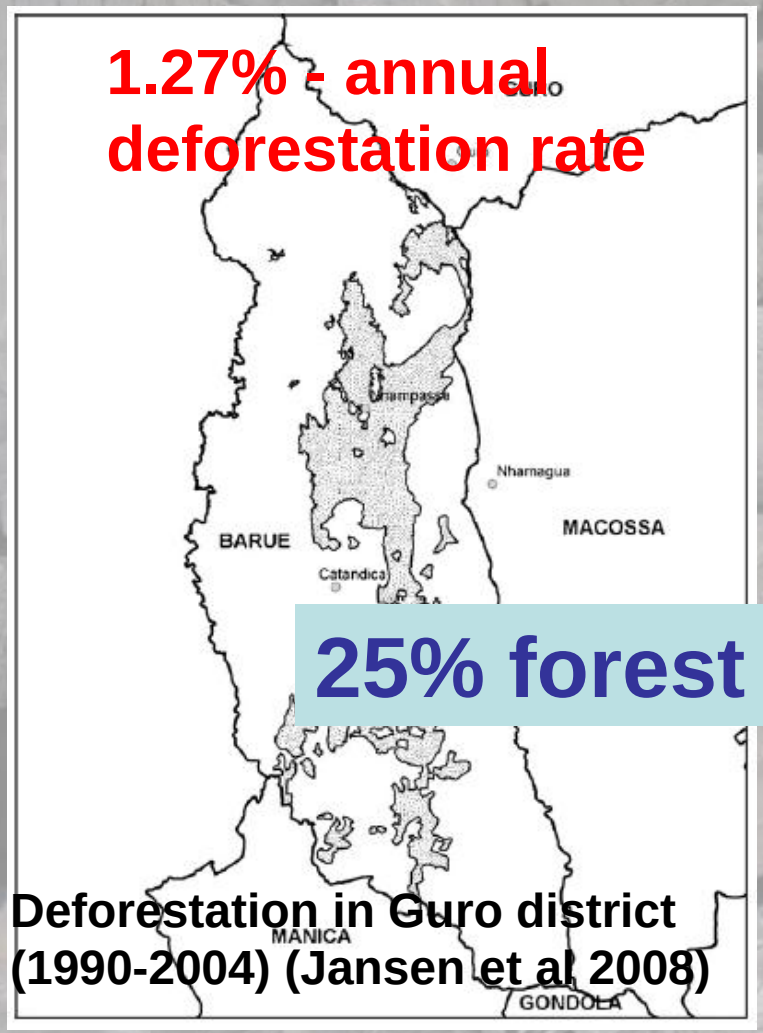
Mozambique fuelwood and charcoal combustion emissions (Tg/year)

	Biomass (Tg DM)	CO_2	CO	CH4	NOx
Chracoal	0.8	2.3	0.2	0.006	0.003
Fuelwood	9.3	14.0	0.6	0.04	0.009

Note: 1 Teragram = 10^{12} grams

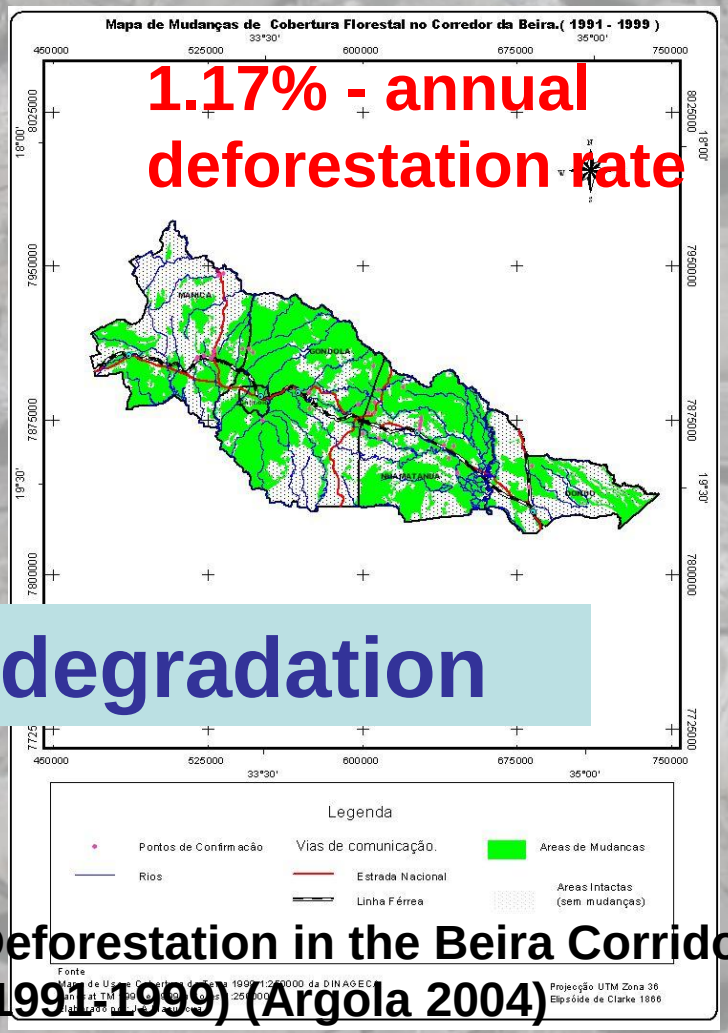
Reduced sinks

1.27% - annual deforestation rate



Deforestation in Guro district (1990-2004) (Jansen et al 2008)

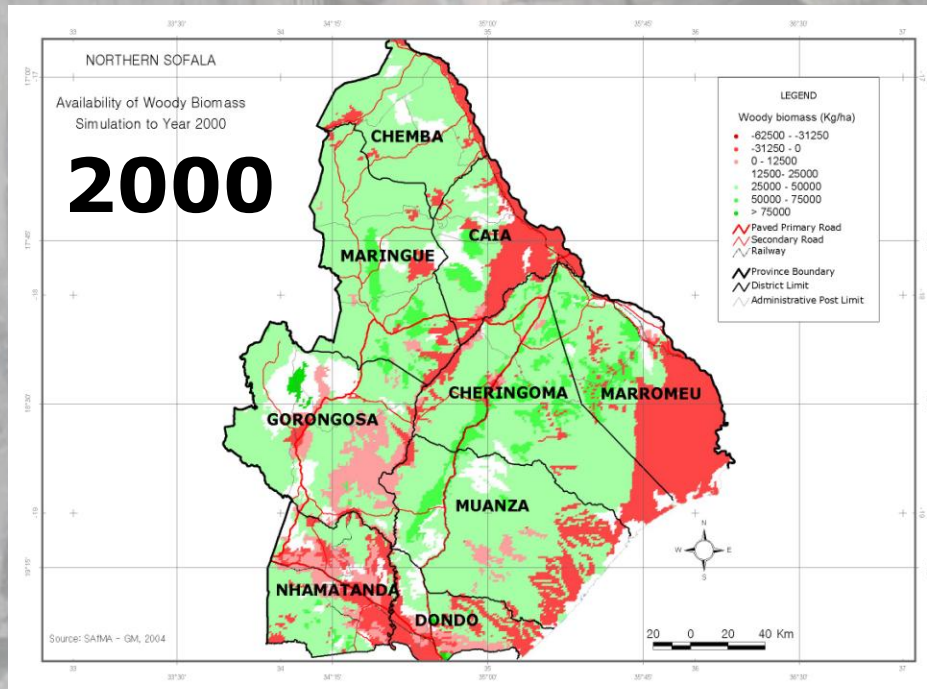
1.17% - annual deforestation rate

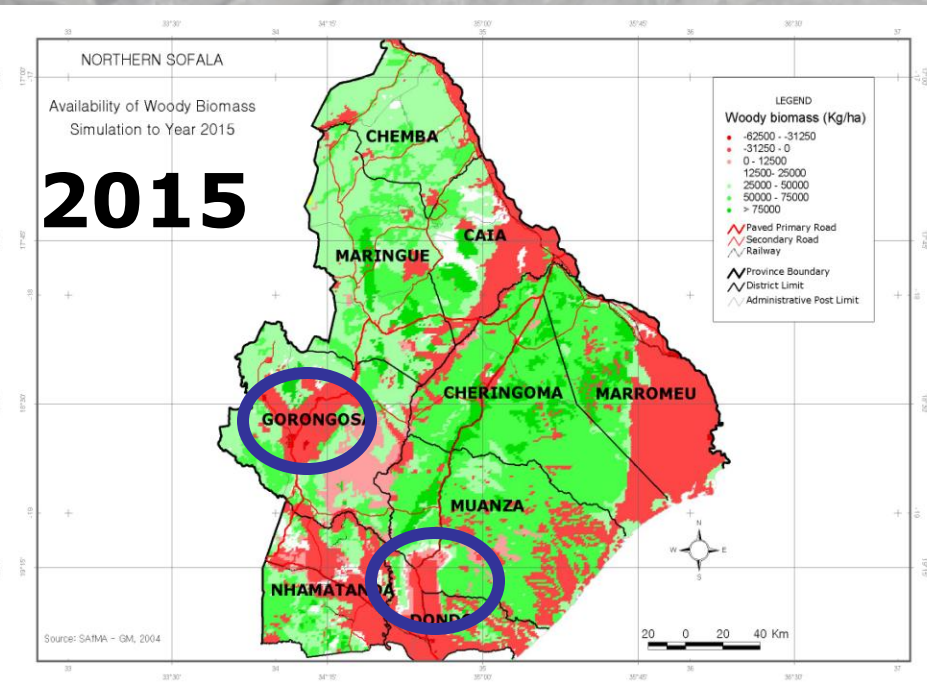


Deforestation in the Beira Corridor (1991-1999) (Argola 2004)

25% forest land degradation

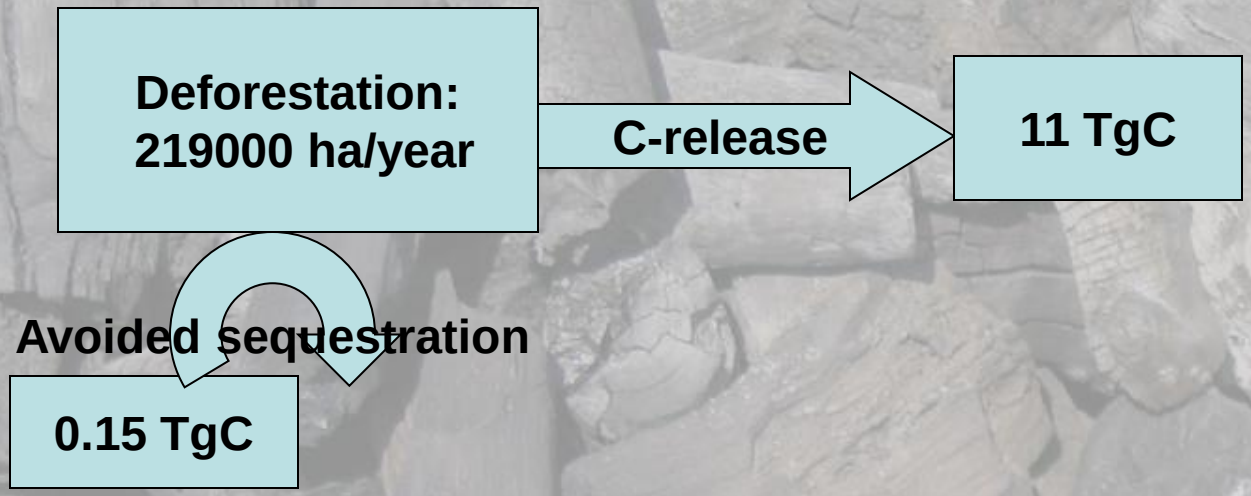
Fuelwood availability





Simulation for Northern Sofala province (Sitoe et al 2004)

LUCC emissions and avoided sequestration in Mozambique



75-80% of the national emissions originate from LUCCF

LUCC: Carbon stock and species diversity

H’ = 2.5

100 tC/ha

0.75 tC/ha/year

H’ = 1.5

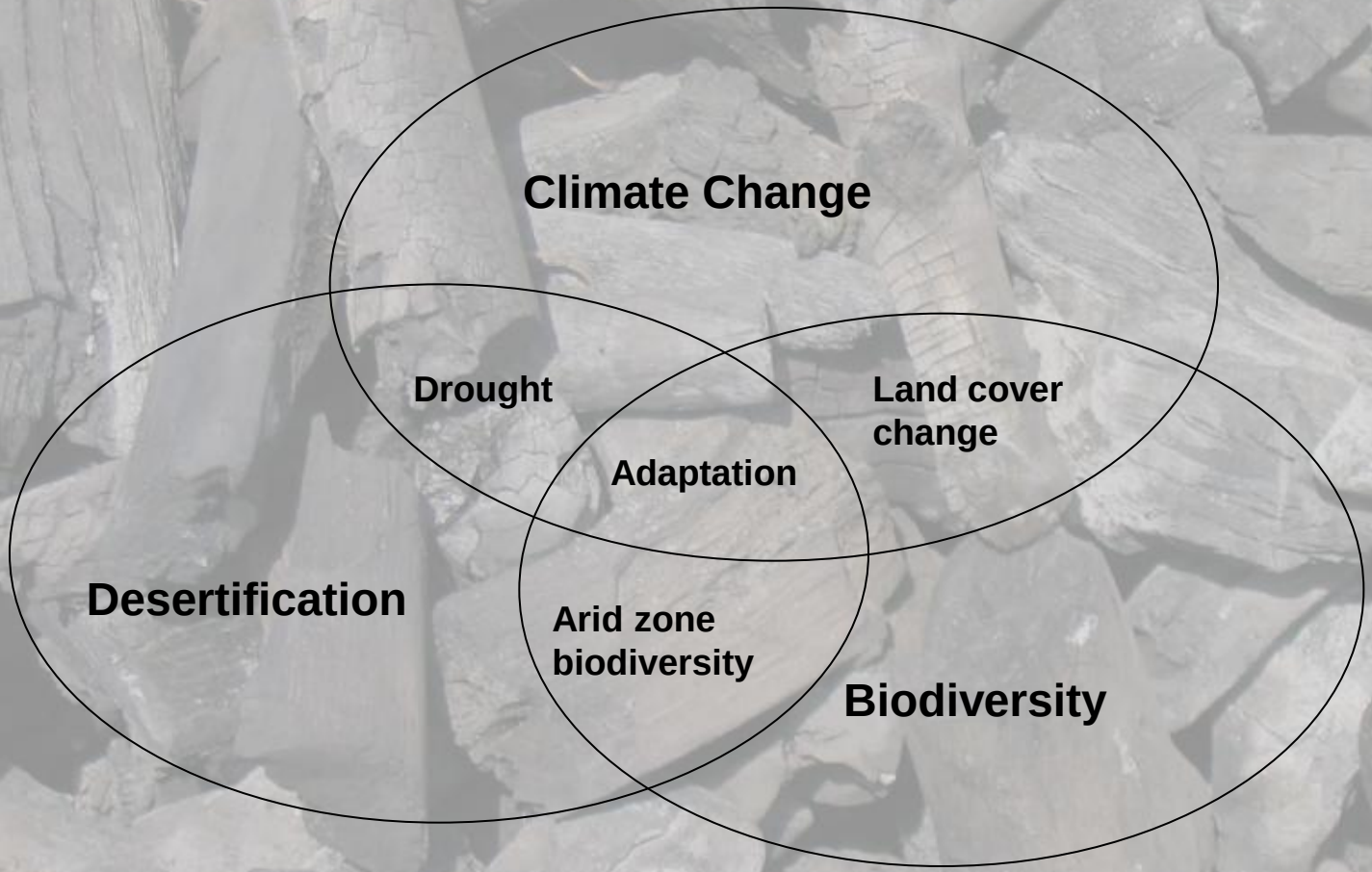
10 tC/ha

H’ = 0.75

2 tC/ha

0.2 tC/ha/year

Multilateral Environmental Agreements



Implementation mechanism

- CBD
  - National Reports
  - National Biodiversity Strategy and Action Plan (NBSAP)
- UNCCD
  - National Reports
  - National Action Plan (NAP)
- UNFCCC
  - National Communications
  - National Adaptation Programs of Action (NAPA)

Concluding Remarks

- Understanding of the processes and underlying causes
- Build capacity to improve local institutions
- Technology transformation
- Modern-biofuels
- Opportunities for Carbon sequestration

Thank you