Agroforestry in Africa for Sustainability and Climate Change Mitigation

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AU research projects in Africa

ENRECA Danida
Capacity building in biology

SEREIN Danida
Multidisciplinary environmental research

New national park in Niger WWF
Consultancy for Aïr Ténéré National Park

SUN EU FP6
Research on sustainable use of natural vegetation

UNDESERT EU FP7
Research on mitigation of desertification

BSU Danida
Capacity building in natural sciences

SHEATHE Danida
Research on pollution related to gold digging and e-waste

TREEFOOD Agropolis, Cariplo, Daniel & Nina Carasso
Research on food security

QUALITREE Danida
Research on native oil trees

Arlomom

Local trees for a better world

- Part of UNDESERT EU project
- Pilot project: application of research results

Agroforestry

Tree planting

Assisted natural regeneration

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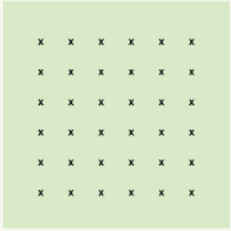
ARLOMOM planting systems

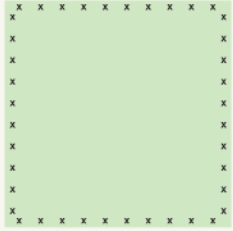
40 ha planted by 30 men, 9 women groups

Intercropping



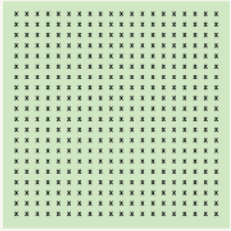
Species	Proportion (%)	No. of trees
Faidherbia albida	30	11
Cordyla pinnata	30	11
Tamarindus indica	10	4
Detarium senegalensis	15	5
Detarium microcarpum	15	5
TOTAL		36

Boundary planting



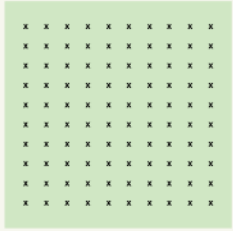
Species	Proportion (%)	No. of trees
Cola cordifolia	20	8
Pterocarpus erinauceus	25	10
Khaya senegalensis	25	10
Tamarindus indica	20	8
Adansonia digitata	10	4
TOTAL		40

Afforestation/reforestation



Species	Proportion (%)	No. of trees
Pterocarpus erinauceus	20	80
Khaya senegalensis	10	40
Parkia biglobosa	30	120
Detarium microcarpum	10	40
Detarium senegalensis	10	40
Daniella oliveri	5	20
Neocarya macrophylla	15	60
TOTAL		400

Assisted natural regeneration



Species expexted	Enrichment species	Proportion (%)	No. of trees
Combretum	*Detarium microcarpum*	20	20
Ziziphus mauritiana	*Neocarya macrophylla*	20	20
Terminalia sp.	*Cordyla pinnata*	20	20
Pterocarpus erinauceus	*Saba senegalensis*	20	20
Prosopis africana	*Detarium senegalensis*	20	20
Daniella oliveri	TOTAL		100

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Local knowledge

Preliminary investigations

- Meeting authorities & chefs
- Qualitative interviews
- Vegetation investigations

Quantitative interviews

- 120 informants, 11 villages
- 55 tree species
- Quick & simple ranking

→Most tree species are declining

→Useful trees are most declining

Species	Abundance	Change	Use value	Planting interest
Adansonia digitata				
Parkia biglobosa				
Cordyla pinnata				
etc.				

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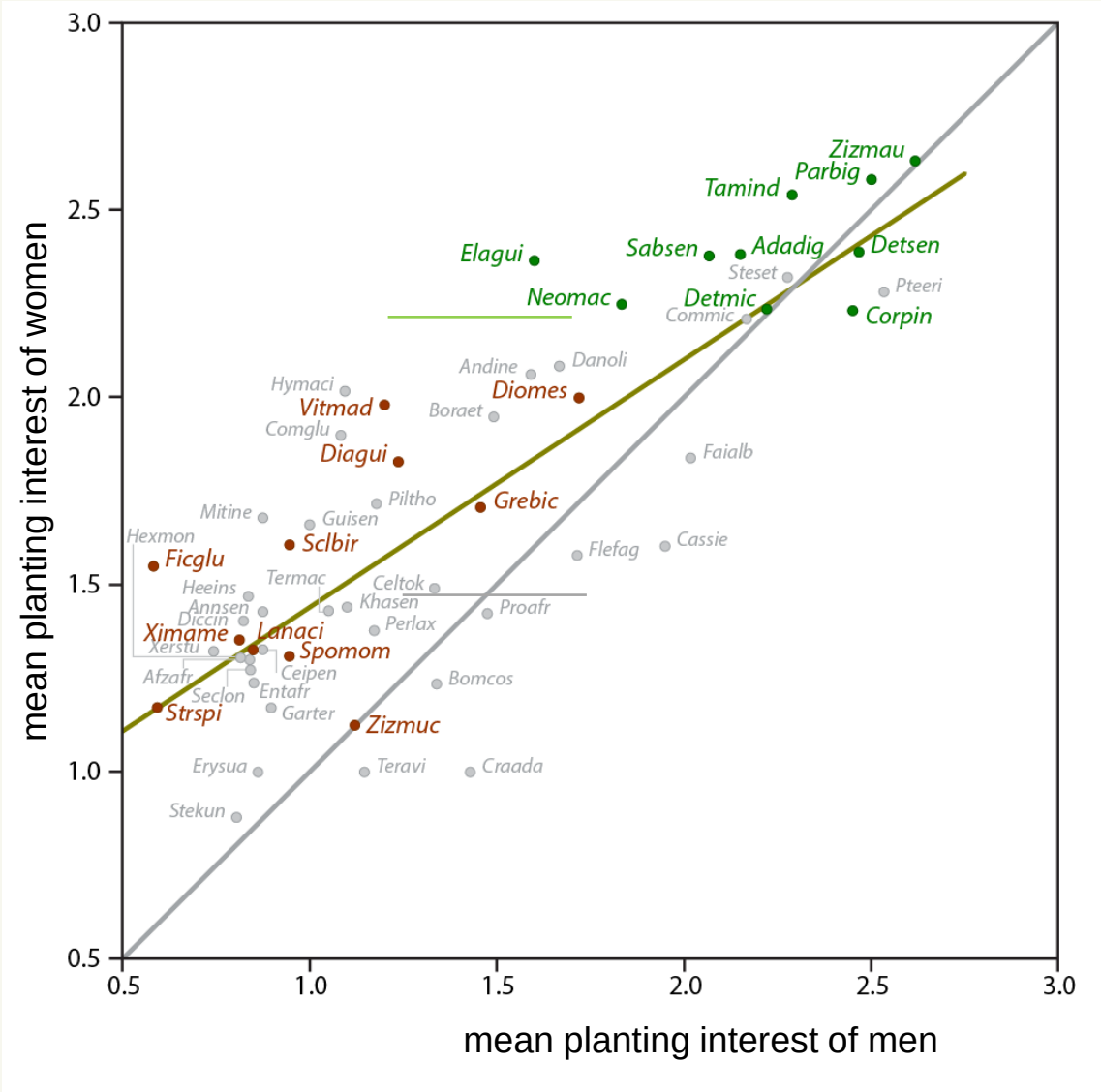
Planting interest – gender differences

Significant correlation between ranking by men and women

But women rank planting interest higher than men

Trees with high quality fruits of highest interest

- Quality edible fruits
- Edible fruits



Why native trees?

Improve livelihoods

- Food security
- Income security
- Health
- Use traditional wisdom
- Biodiversity
- Medicine
- Ecosystem resilience
- Species conservation
- Climate change mitigation

Participatory approach

Many advantages

- Profound local knowledge
- Selection of socially and economically important species
- Leads to engagement
- Threatened

… and some disadvantages

- Climate change not considered
- Biological key-stone forgotten
- Threatened might be forgotten
- Full potential of species not always known

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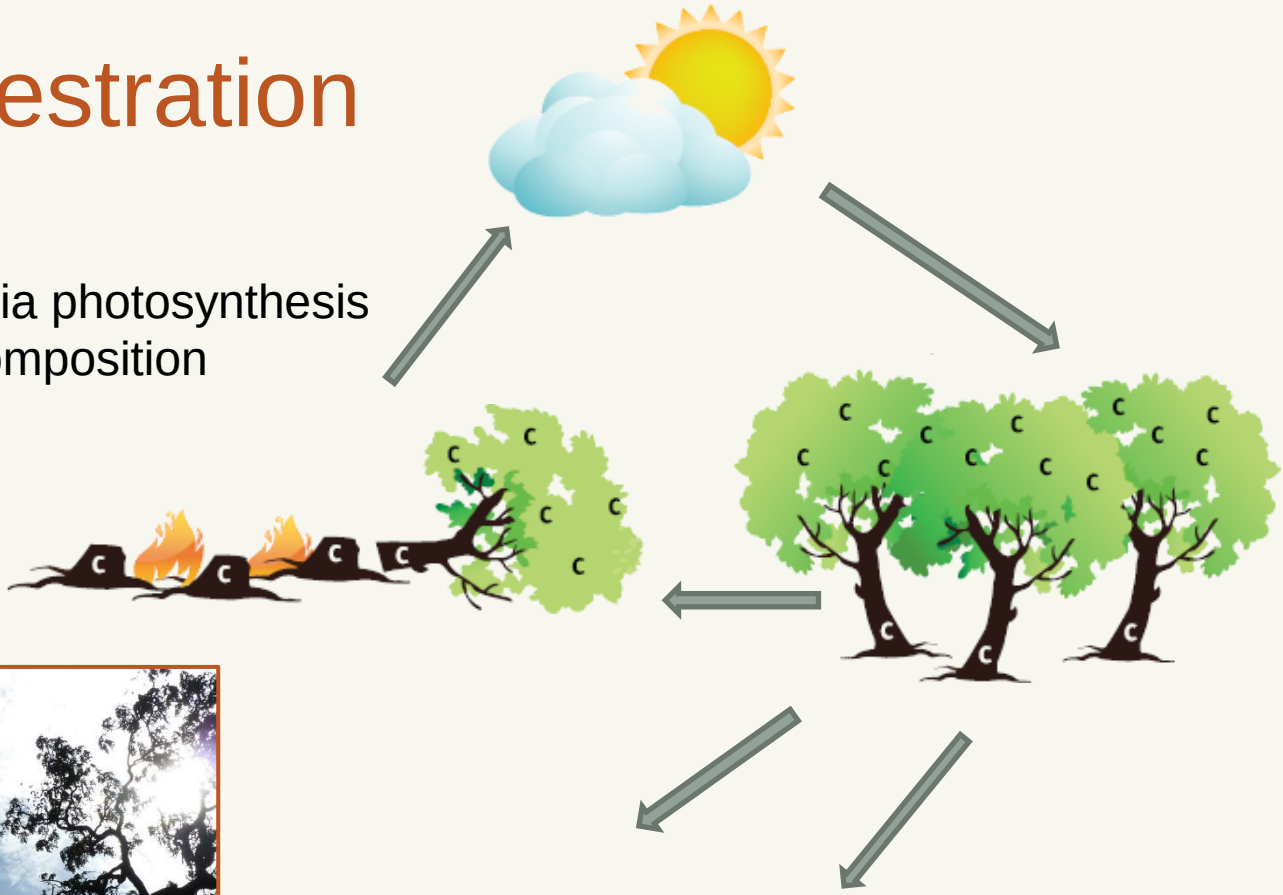
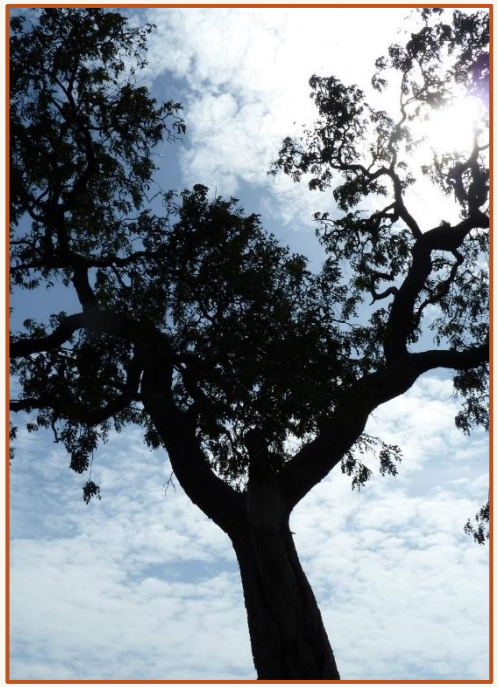
Carbon sequestration

- CO_2 in the atmosphere
- CO_2 absorbed in trees via photosynthesis
- CO_2 released from decomposition

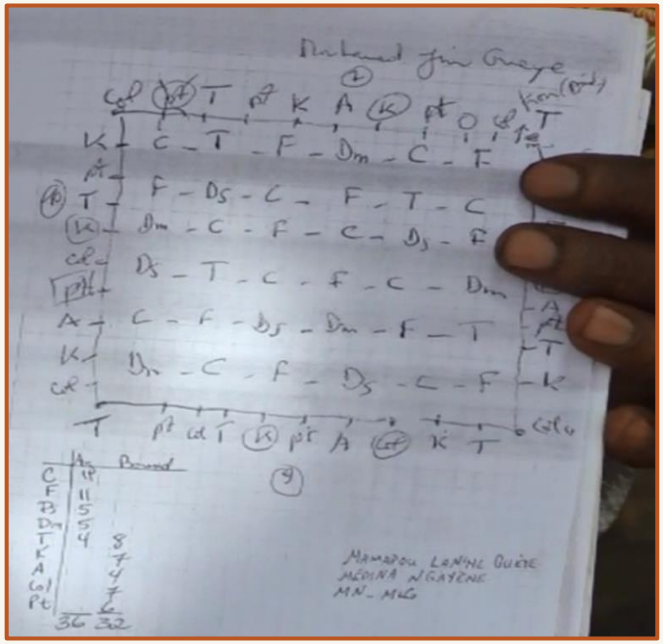




Carbon certification

Plan Vivo

- Carbon sale at voluntary market
- Rates are paid up front
- Socio-economic improvements count



AARHUS UNIVERSITY
DEPARTMENT OF BIOSCIENCE

Carbon payment

40 ha planted

- 30 men, 9 women groups

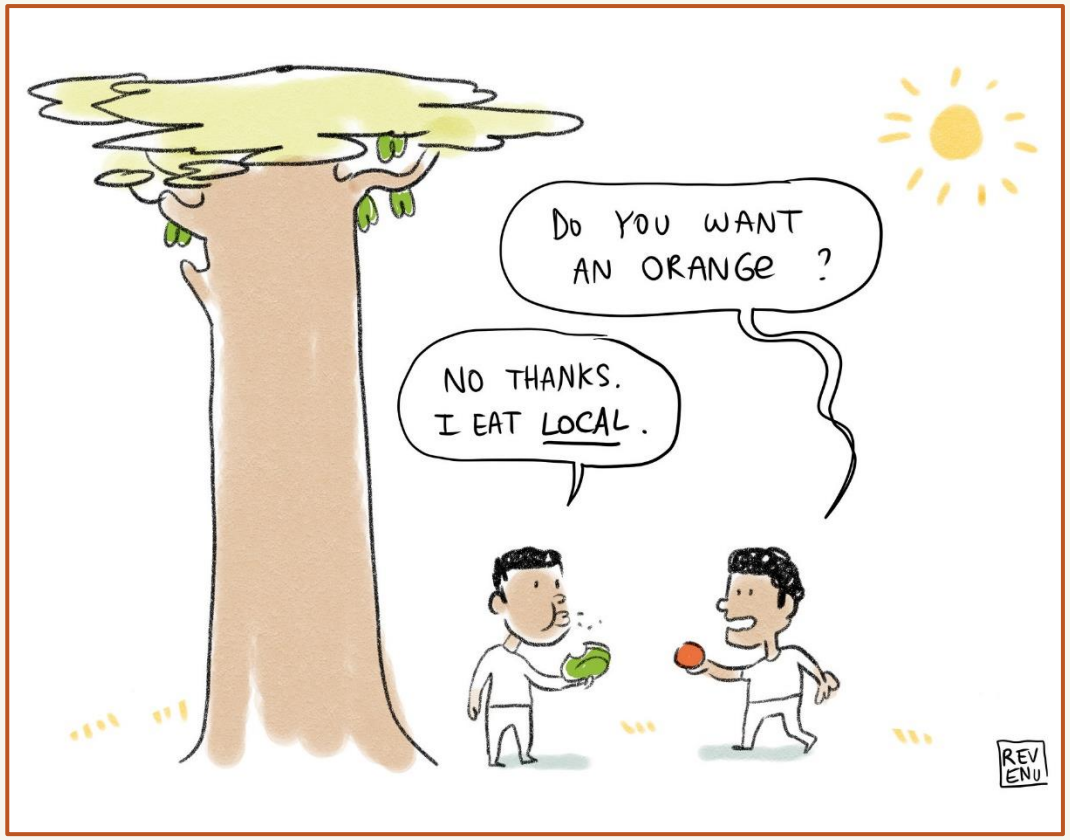
Carbon payment

- 5500 tCO_2 over 30 years
- 44000 € in total (8 €/tCO_2)

Agroforestry for food and carbon in Africa

Many good reasons

- Labor in Africa is cheap
- Jobs in remote areas
- Output from crops is low
- Simple and low-cost
- Food, health, income
- Empower women
- Natural benefits
- Climate benefits



Win-win-win: Sustain ecosystem services, human wellbeing and climate mitigation at the same time

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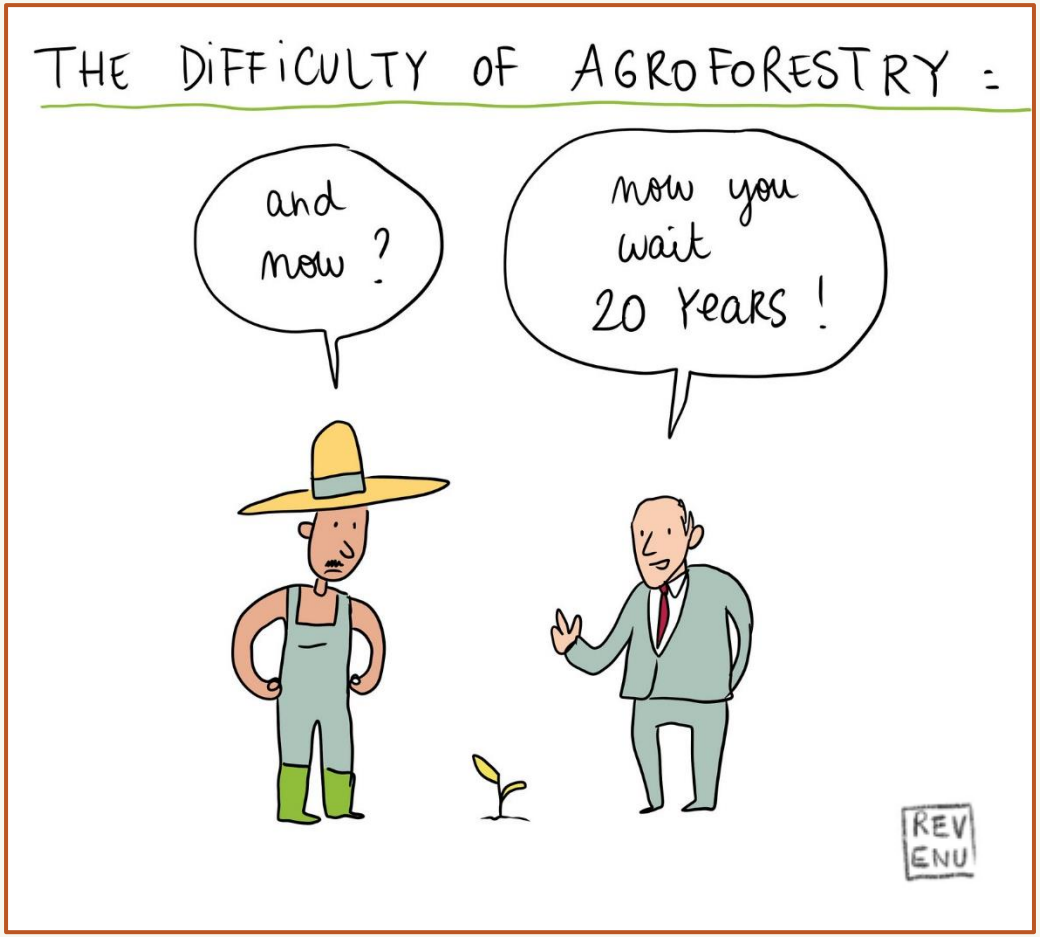
Complications in agroforestry

- Long term
- Continuity
- Labour intensive
- Constant follow up
- Risks (fire, drought, browsing)
- Lack of means for action
- Cost a bit to establish
- Good collaboration



Optimal to establish with wood-conserving installations

Conclusion

Agroforestry for food and carbon has great potentials

An obvious way to mitigate climate change and enhance nature and local livelihoods

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Establishment is not simple

Coordination with wood-conserving initiatives needed

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Arlomom

Local trees for
a better world

Search for
ARLOMOM
on YouTube

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Thanks to colleagues at

- University of Cheikh Anta Diop, Dakar, Senegal
- Bioclimate Research and Development, Edinburgh, UK

Thank you for your attention