



THINKFOREST

Facilitated by European Forest Institute



BECOMING CARBON NEUTRAL IN EUROPE: HOW CAN CARBON FARMING IN FORESTS CONTRIBUTE?

Ana Rey

Spanish Natural History Museum

Tommaso Chiti

University of Tuscia,
Italy

16th October 2024

Permanent Representation of Austria to the European Union, Brussels



What is carbon farming?



Why forests?



The European context



Objectives



What is Carbon Farming

EU climate neutrality target 2050

- To reduce GHG emissions 55% compared to 1990 levels by 2030
- To become carbon neutral by 2050, the European Union (EU27)



Fit for 55 – LULUCF modification:

- ambitious target for net carbon removals in soils, forests and wood products: **-310 Mtons CO₂eq by 2030**

Communication on Sustainable Carbon Cycles:

roadmap to enable carbon removals:

- carbon farming should contribute to 2030 target for LULUCF
- industrial solutions should remove at least -5MtCO₂eq in 2030



What is Carbon Farming

“Carbon farming can be defined as any practice or process, carried out over an activity period of at least five years, related to terrestrial or coastal management and resulting in capture and temporary storage of atmospheric and biogenic carbon into biogenic carbon pools or the reduction of soil emissions”.



What is Carbon Farming

Benefits of carbon farming



Increased
carbon removals



More biodiversity
and nature

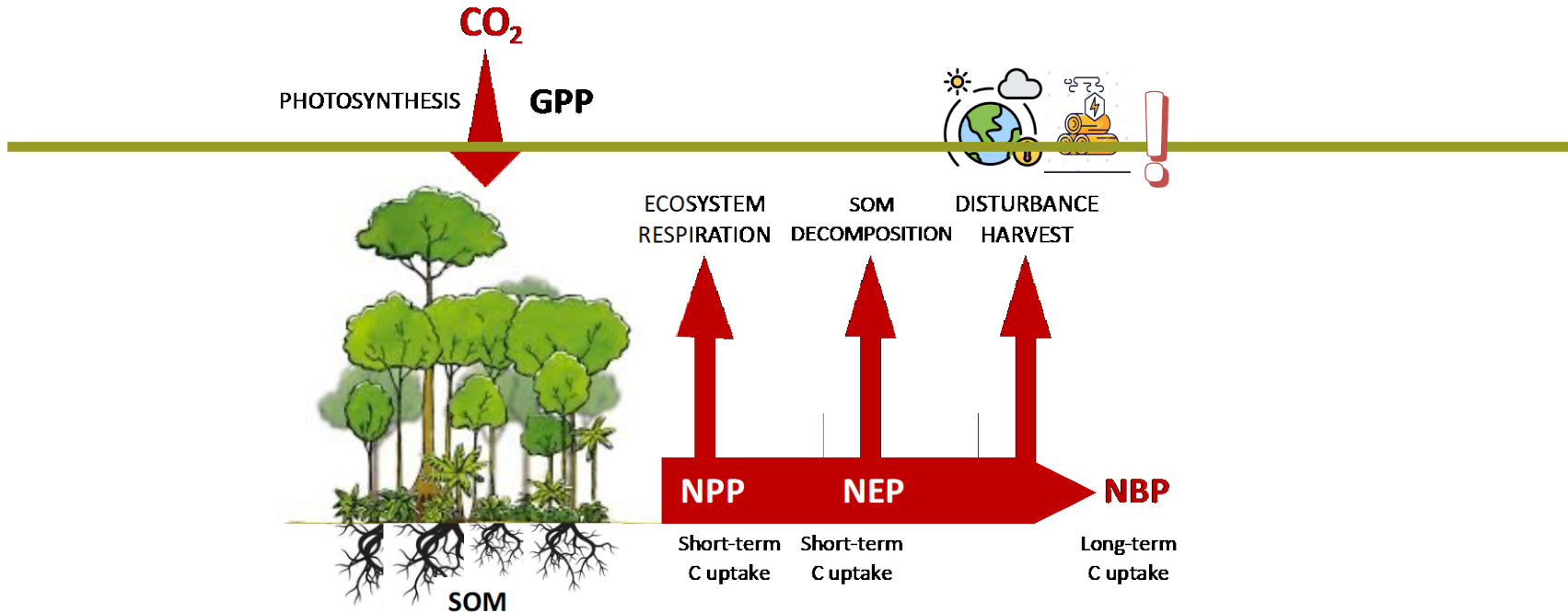


Increased climate resilience
of farm and forest land



Additional income
for land managers

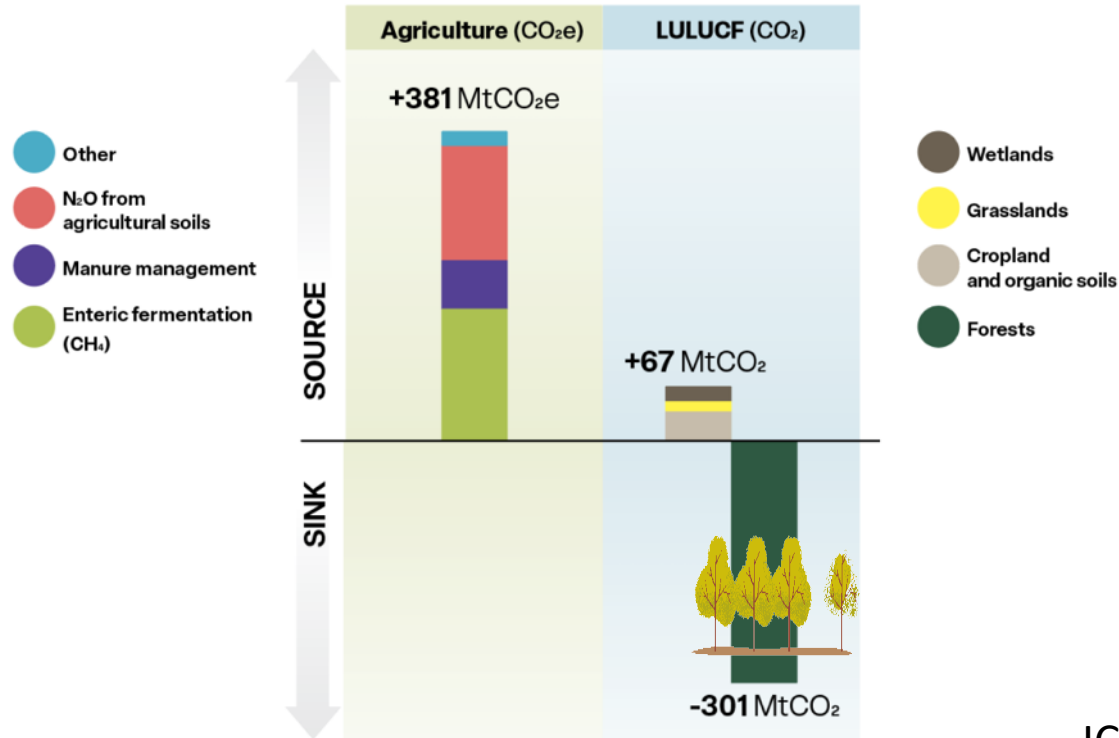
Why forests?





Potential forestry sector

The EU greenhouse gas emissions from the agriculture and LULUCF sectors in 2022



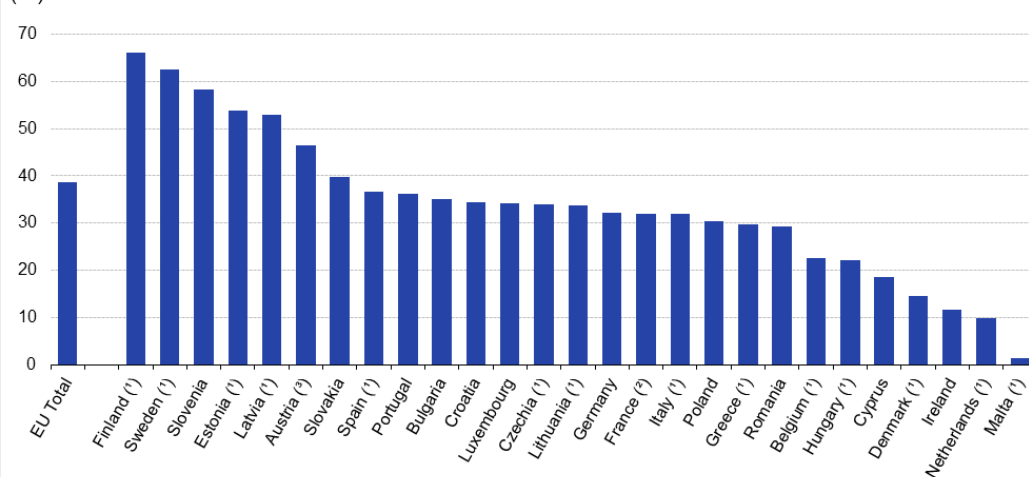
ICOS (2022)



The European context

Forest area in the EU, 2021

(%)



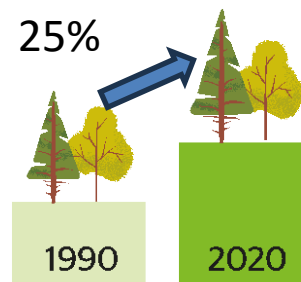
Source: Eurostat, FAO (online data code: for_area_efa and reg_area3)

eurostat 



Forests cover
35%
of Europe's total land area
2 million km²

25%



1990

2020

129m³/ha

169m³/ha

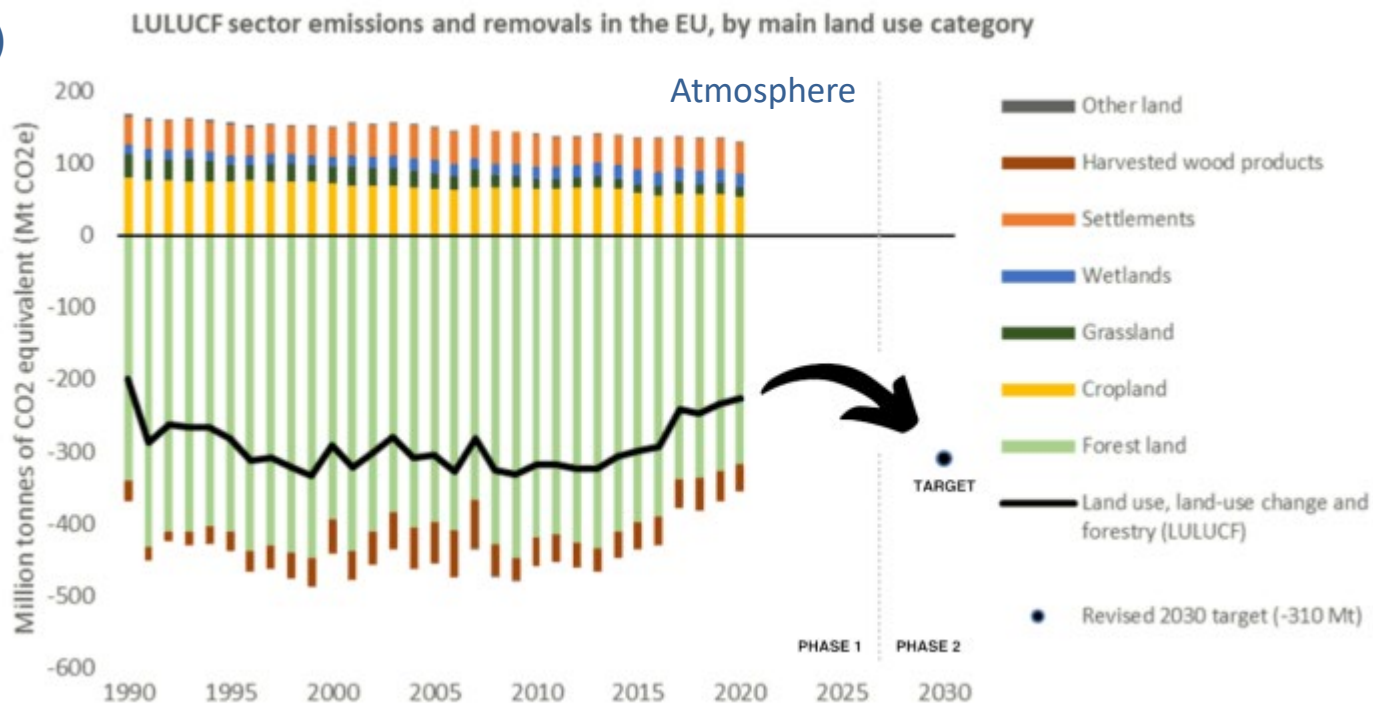


The European context

SOURCE
(release)



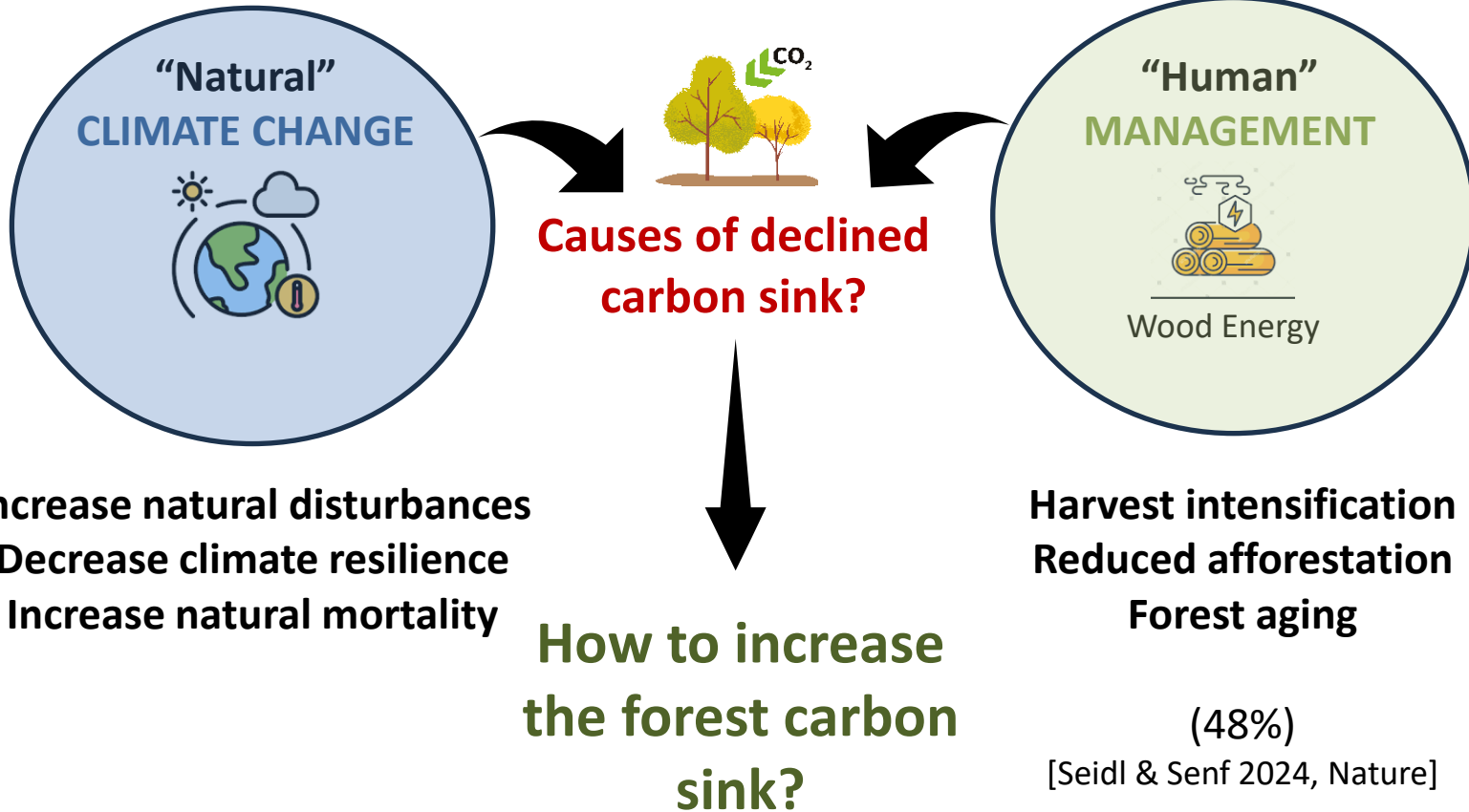
SINK
(uptake)



European Environment Agency, 2022



The European context





The European context



Forest management

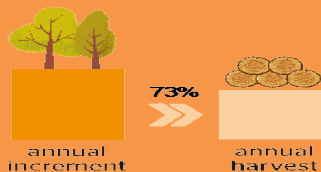
1

Increase productivity



2

**Improve resilience and
climate adaptation**



3

**Improve use of wood
products**



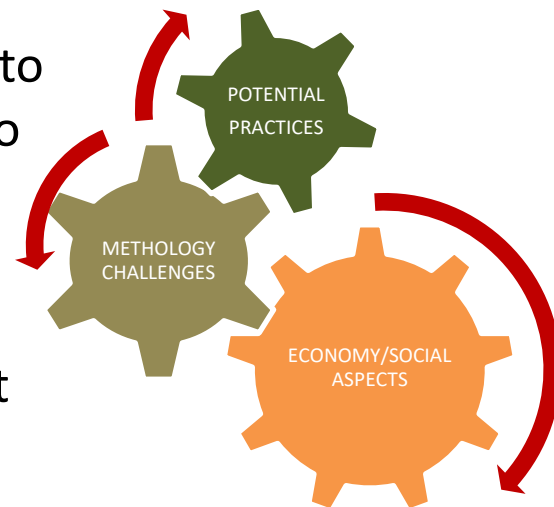
“Climate smart forestry”



Objectives

Analyse the role that forest-related CF practices can play in meeting climate neutrality by 2050

- Can forests help us meet the commitment set by the European Union? By 2050?
- Can we improve forest management practices to enhance carbon sequestration and resilience to climate change?
- How can we measured reliably carbon sequestration?
- What are the economic and policy aspects that need to be considered?
- Main conclusions and recommendations





Key messages

- **Forest management should be crucial to improve the resilience and climate change adaptation** since forest sink capacity is declining.
- More than 80% of European soils are affected by soil erosion. Since soils store the largest amount of carbon and host the greatest biodiversity, **preserving and storing carbon in forest soils should be a priority**
- Any carbon farming project should include a complete **life cycle assessment** including the end use of wood products.
- **Forest-management practices that increase both the amount of wood produced and the carbon stock retained in the forest should be prioritised**



QU.A.L.I.TY criteria



Sustainable Practices



Challenges



Implementation



Concluding remarks



QU.A.L.ITY Criteria for a robust certification system



QUANTIFICATION

*Carbon removal activities must be **precisely measured** and offer unequivocal climate benefits*



ADDITIONALITY

*Carbon sink activities go **beyond common practices***



LONG-TERM STORAGE

*Certification considers the duration of carbon storage, distinguishing **permanent from temporary storage***






































SUSTAINABILITY

*Carbon sequestration activities must not harm the environment and also support **other environmental objectives** such as the protection of **biodiversity***

Which forest management practices are suitable for carbon farming?

=> practices based on the four EU Q.U.A.L.I.T.Y criteria

 = High
 = Medium
 = Low

	Quantification	Additionality	Permanence	Leakage Prevention
AFFORESTATION				
SPECIES SELECTION				
NO HARVESTING				
AGROFORESTRY				
STRUCTURE DIVERSIFICATION				
THINNING INTENSITY				
FIRE MANAGEMENT				
PEATLAND RESTORATION				



Impact on main carbon pools

Afforestation

Sivicultural
practices

Diversification
of structure

Site
Fertilisation

Agroforestry

Peatland
Management

+

+

+

+

+

+

+

=

/

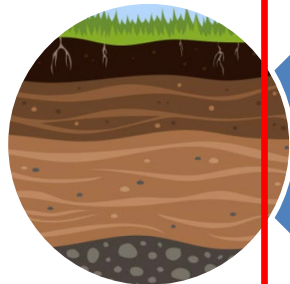
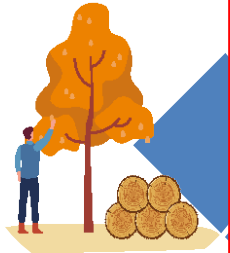
+

=

=

+

+



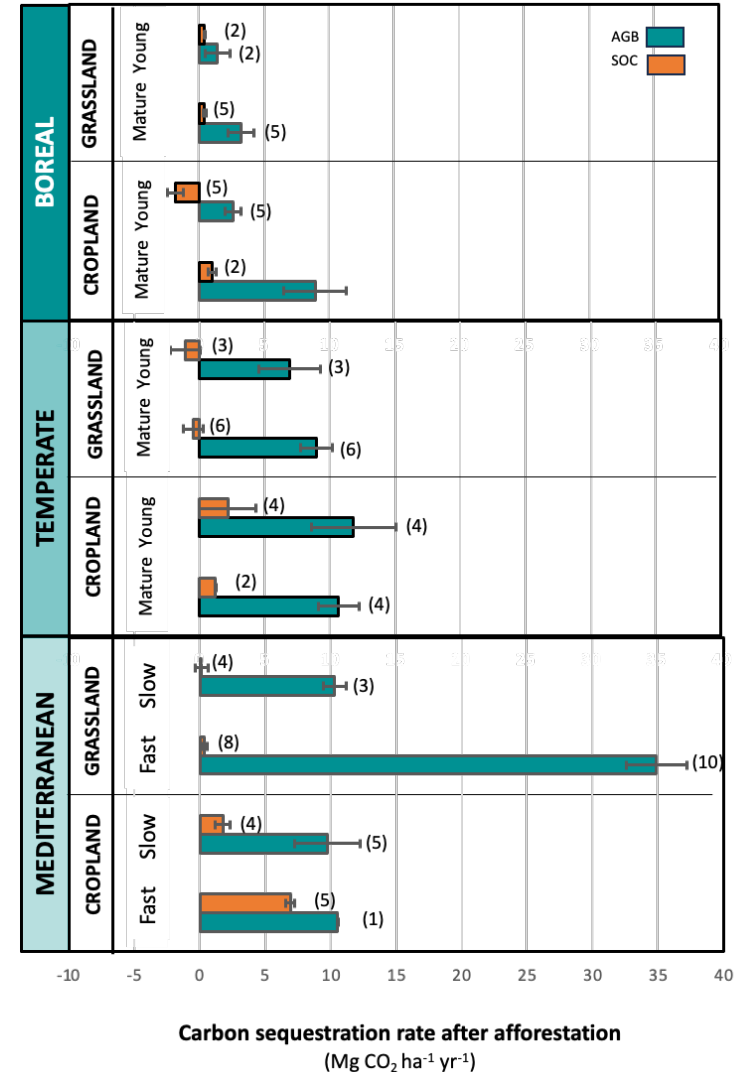
Afforestation



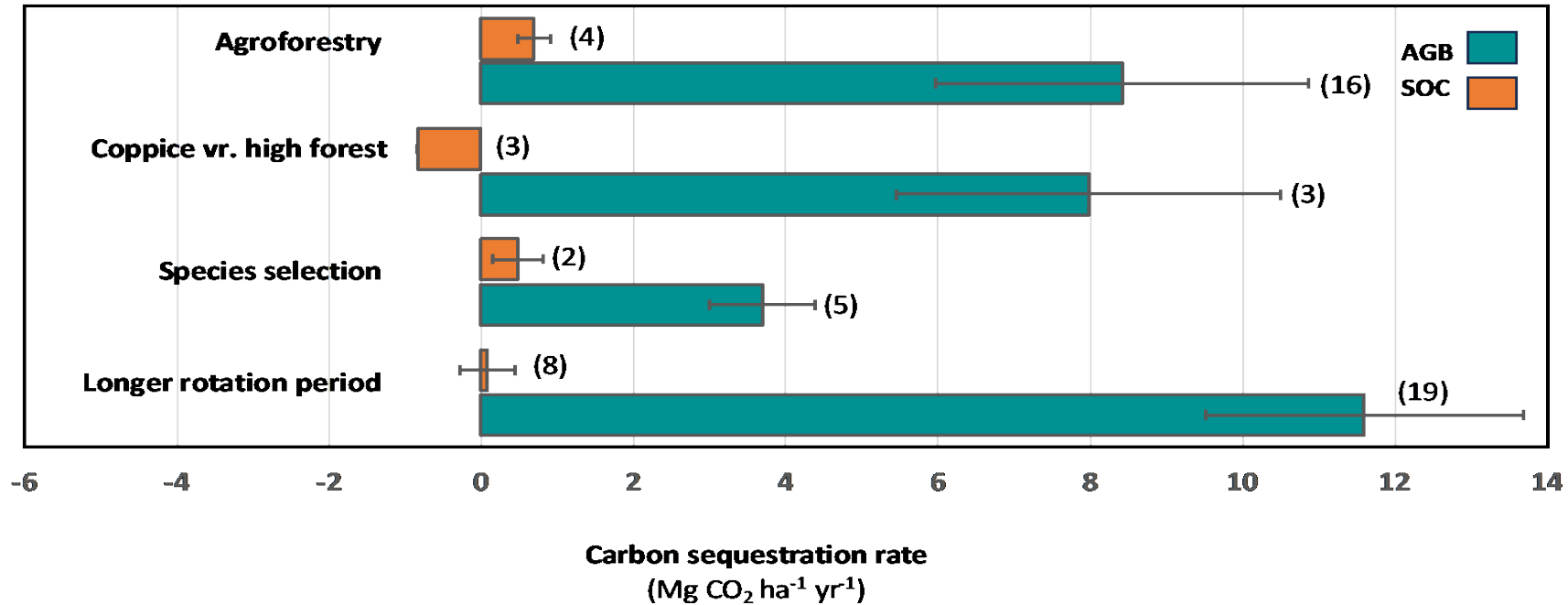
THINKFOREST

Afforestation (=conversion of land use)

1. Carbon sequestration both above and below-ground (most cases)
2. Increase in land use competition
3. Limiting land availability
4. Lack of genetic material



Mediterranean area



- **Agroforestry:** enhance biodiversity, multiple ecosystem services, C sequestration
- **Coppice vr High forest:** unclear how Soil Carbon pool is affected
- **Species selection:** Fast growing vr Slow growing tree species
- **Longer rotation periods:** crucial to assess potential disturbance risks



Main challenges for carbon farming in forests

CHALLENGES

- **Long and variable timescales** vs short-term/long-term climate goals
- **Non-permanence of forest carbon storage** vs balance potential benefits with associated disturbance risks
- **Setting baselines and verifying carbon removal**
- **Additionality** requires “proof” + needs to deliver multiple environmental co-benefits
- **Methodological quantification problems:** changes in soil carbon are difficult to measure and quantify → Hybrid approach promising



Ways forward

- **Uncover conflicting policy goals** and resolve them
- **Establish reliable systems for monitoring and reporting**
- **Agree on standardised methodologies** with transparent guidelines for baseline development
- **Define the exact scope for removal projects**



Ways forward

- **Determine Carbon removals conservatively**
- **Adopt dynamic measures** (e.g. temporal carbon credits)
- **Prioritise market leakage prevention** (transparent and rigorous accounting practices)
- **Include carbon markets visibly in the country's national greenhouse gas inventory**



Key messages

- Forests in Europe are aging so carbon farming represent an **opportunity to promote uneven age stands**
- Many measures require **long time spans** to provide a carbon benefit
- Carbon Farming measures suffer from methodological quantification for changes in **soil carbon**
- Carbon Farming as **an incentive system for the land managers** to increase carbon sinks
- The **success of the practices** may critically depend on regional **forest risk** exposure (fire, wind, pests, etc.) and forest responses to climate change.



Content: Executive summary – Forest Management Practices – Measurement challenges – Policy and economic aspects – Conclusions and recommendations

Authors: Tommaso Chiti, Ana Rey, Jens Abildtrup, Hannes Böttcher, Jurij Diaci, Oliver Frings, Aleksi Lehtonen, Andreas Schindlbacher, Miguel A. Zavala

Thanks: EFI's Trust Fund countries

Thanks!

Further info:

European Forest Institute

www.efi.int

