Climate Change Mitigation
The Forests' Role

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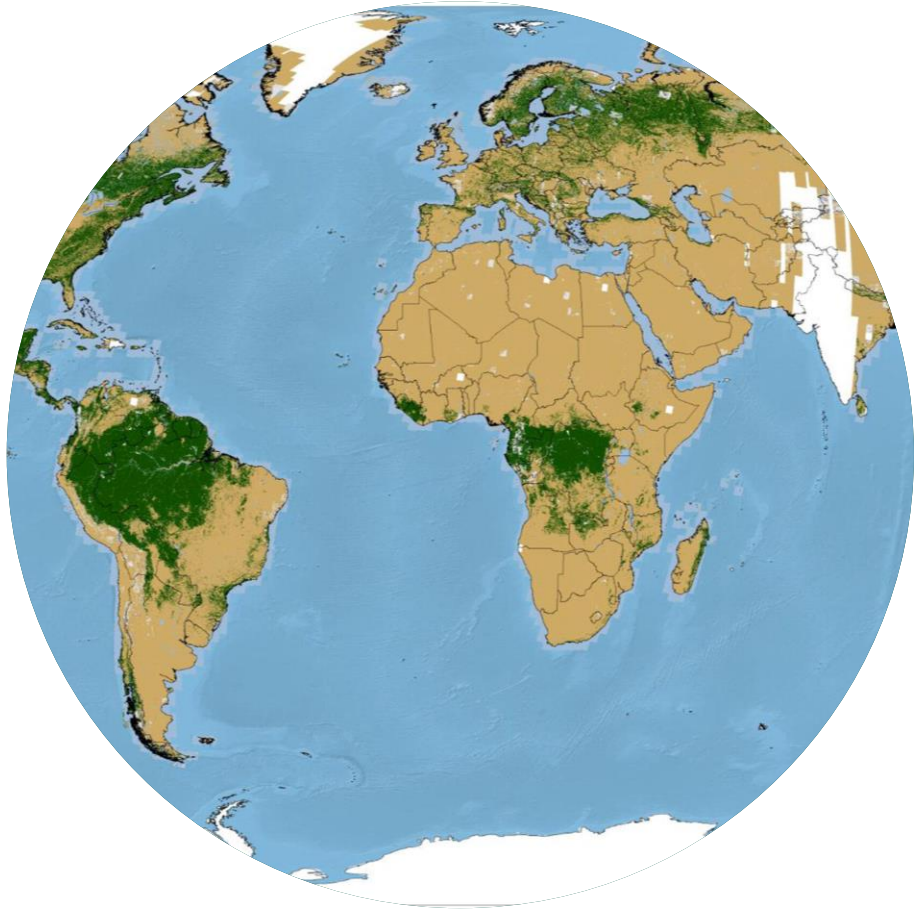
Natural role of forests in the global climate

- Palaeotropic “Coal forests“ had a strong influence on the global climate (Cleal and Thomas, 2005)
- World‘s old growth forests as a cabon sink (Luyssaert et al., 2008)

→ with the industrialisation the absorbed CO^2 was released rapidly and the climate began to change again



https://chilecitymap.pages.dev/new-pvklil-unraveling-the-worlds-forests-a-comprehensive-guide-to-forest-mapping-hvvylg-pics

Current state of the forests in the global climate

- Managed and unmanaged forests work as a carbon sink (Jia et al., 2019)
- Reduction of carbon sinks due to intensified disturbances and deforestation (Pan et al., 2024)
- German forests are currently a source of CO^2 (BMEL, 2024)

https://ens-newswire.com/amazons-dark-earth-secret-promises-global-forest-renewal/

Two main demands upon forests

- Forests should give ecological benefits and work as a CO^2 sink
- They must deliver fast growing wood
- Use the forest or keep the forest?

https://ichef.bbci.co.uk/news/624/cpsprodpb/14BA6/production/_113020948_for1.png

Two main demands upon forests

- Monocultural forests bind CO^2 in short time and have less biological benefits compared to mixed forests
- Mixed forests take longer to bind CO^2 but after 100 years they have a higher stock capacity
- Pinus silvestris – Fagus silvatica forests have a big potential

(Rodriguez de Prado et al., 2023)

Use the forest or keep the forest?

- Forestry in a continuous cover forest (Pinus silvestris-Fagus sylvatica)
- Use of agricultural land for Short Rotation Coppice
  → Regular coppice of trees with regular revenue
  (Vanbeveren et al., 2019)
- Keep forests unmanaged to be a CO^2 sink

Allocated role of forests on an international level

- Significantly increase the area of forests worldwide (UNDESA, 2021)
- Enhance their contribution to biodiversity conservation and Climate Change mitigation (UNDESA, 2021)
- Increasing demand for wood and non-wood products for the global bioeconomy (Verkerk et al., 2022)

UN environment
United Nations Environment Programme

https://www.citiesalliance.org/united-nations-environment-programme-un-environment

Allocated role of forests on a supranational (EU) level

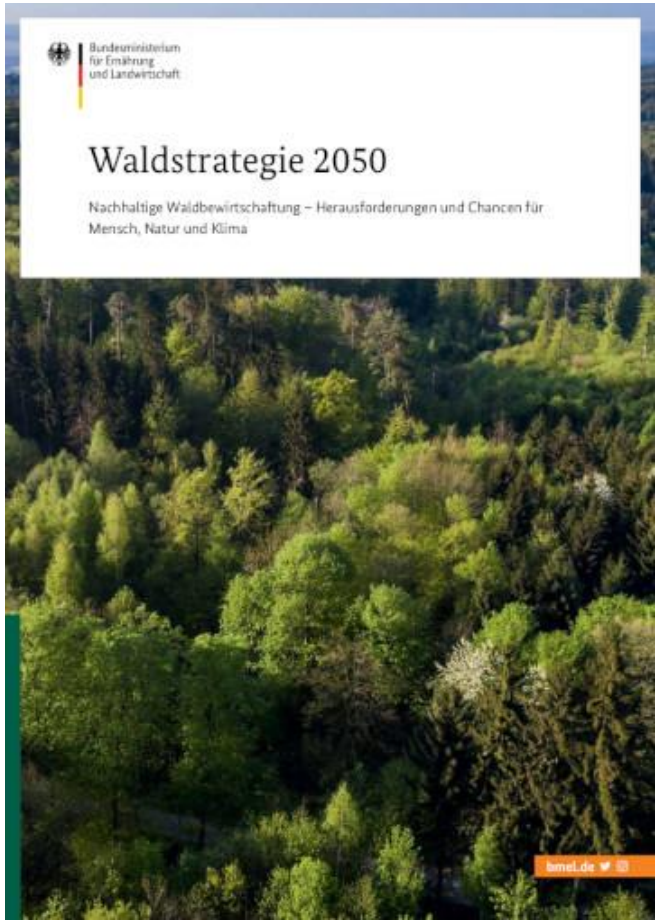
- Forest-based bioeconomy
- Substitution of fossil fuels in raw material production
- Increase the carbon storage in forest land & harvested wood products

(European Union, 2021)

https://foemalta.org/blog/european-green-deal-save-europe-planet/

Allocated role of forests on a national level

- Main demand:
  - The use of wood and non-wood products for the bioeconomy (BMEL und BMBF, 2020)
- Also the provisioning of ecosystems services:
  - Climate mitigation and adaptation
  - Recretion and a healthy environment
  - Drinking water protection (BMEL, 2021)



https://www.bmel.de/DE/themen/wald/waldstrategie.html

Discussion

- Wood is still important and should be used as a long-lasting material

- Less usage of wood to activate the forest as a CO^2 sink

→ mixed forests with min. 30% protected area as a buffer zone

https://as2.ftcdn.net/v2/jpg/02/67/79/85/1000_F_267798535_Az53BPz0RE7ArRJ6jSY4lvPCOstyFDrF.jpg

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"Climate change is sometimes misunderstood as being about changes in the weather. In reality, it is about changes in our very way of life."

– Paul Polman

Literature

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