Expanding the multifunctionality of agroforestry at landscape scale



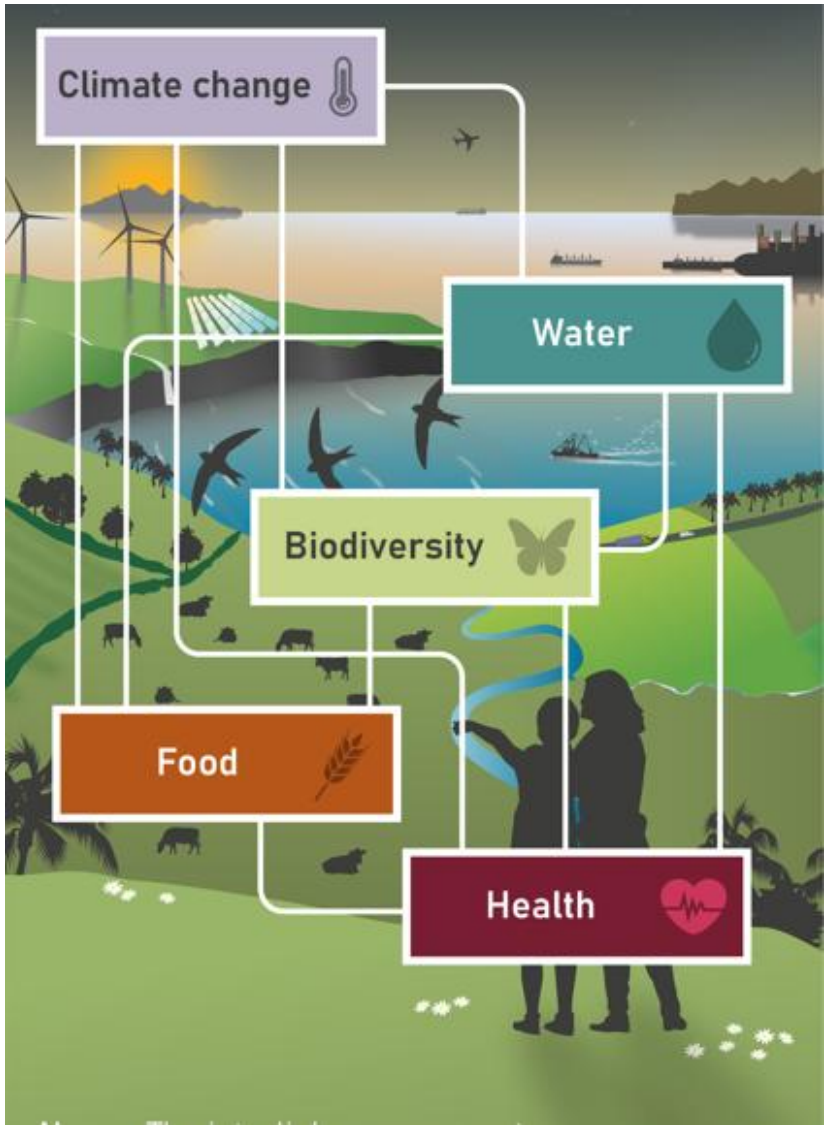
Tobias Plieninger

Research & Development Days
11 November 2026

GEORG-AUGUST-UNIVERSITÄT GÖTTINGEN IN PUBLICA COMMODA SEIT 1737

UNIKASSEL VERSITÄT

The sustainability crises are interconnected – Our solutions are not!



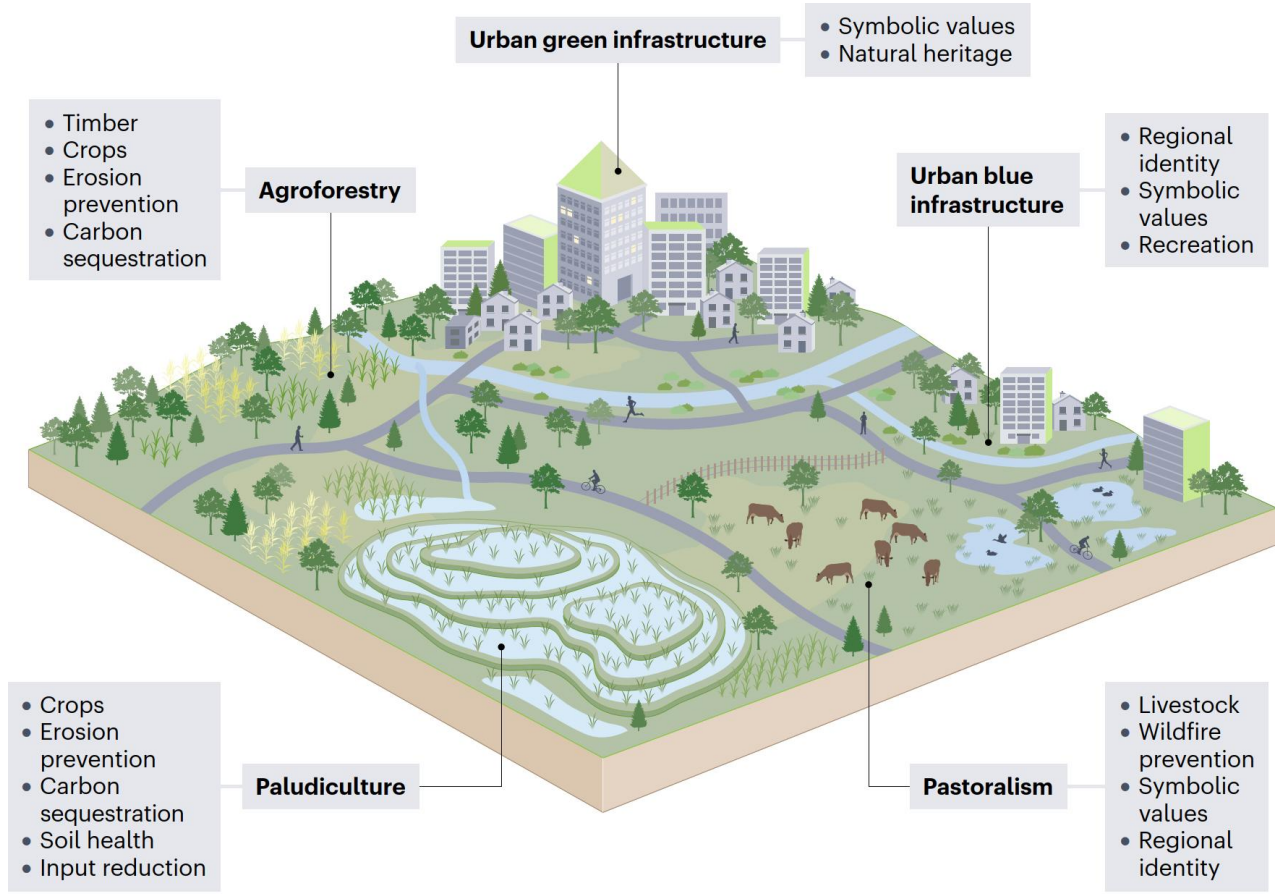
(IPBES 2025)



(Scherr et al. 2015)

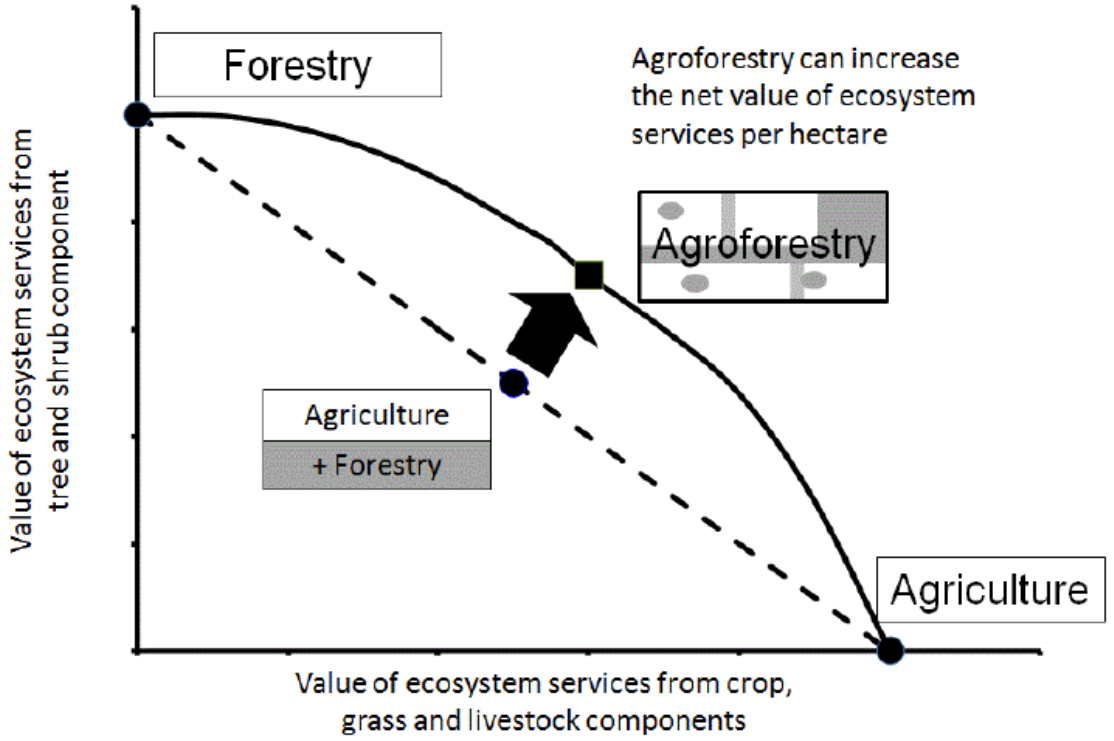
Multifunctionality: The concept

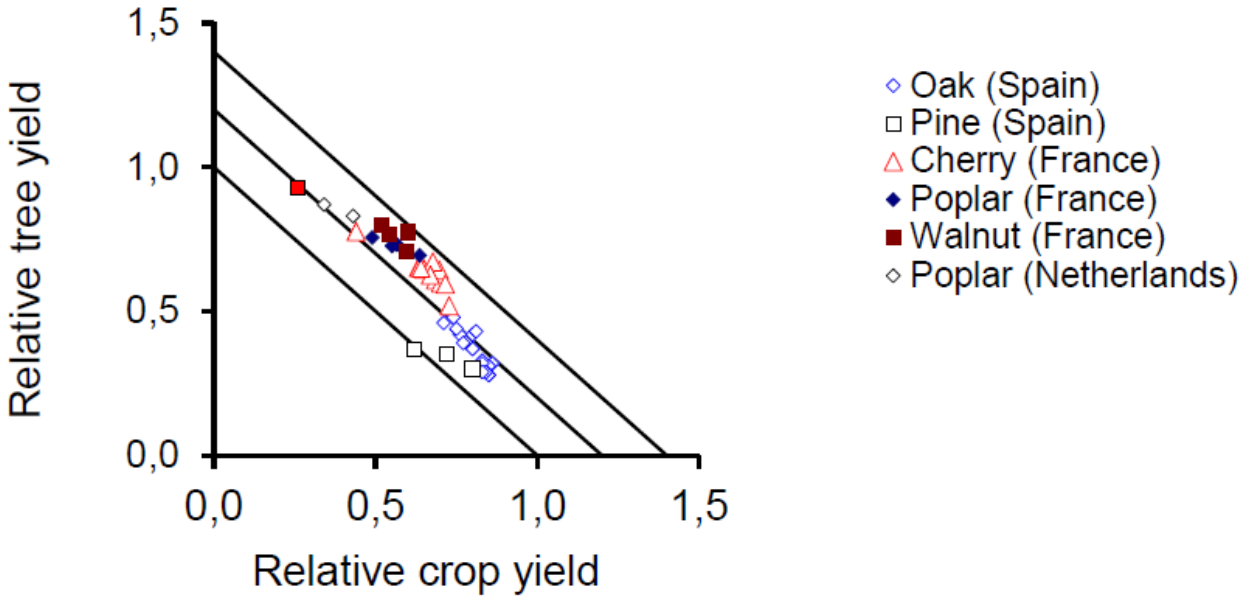
- "The joint supply of several ecosystem services, including provisioning, regulating, and cultural services, at landscape scale." (Stürck & Verburg, 2017)
- Widely used in ecology, agriculture / forestry, and landscape planning.



(Jay & Plieninger 2025)

Agroforestry is by definition multifunctional





(Graves et al. 2007)

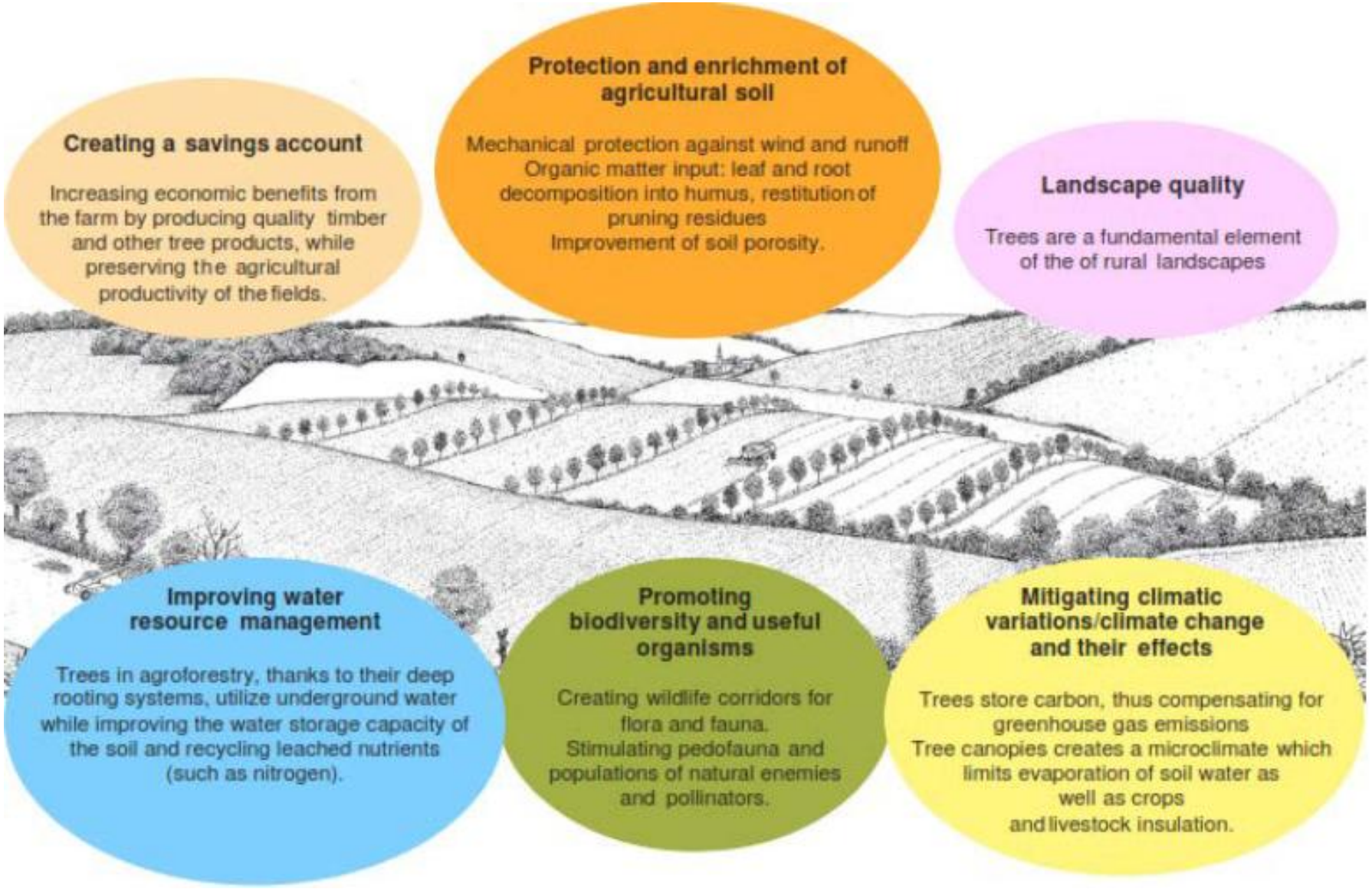
(D. Freese)

But is this ambitious enough?



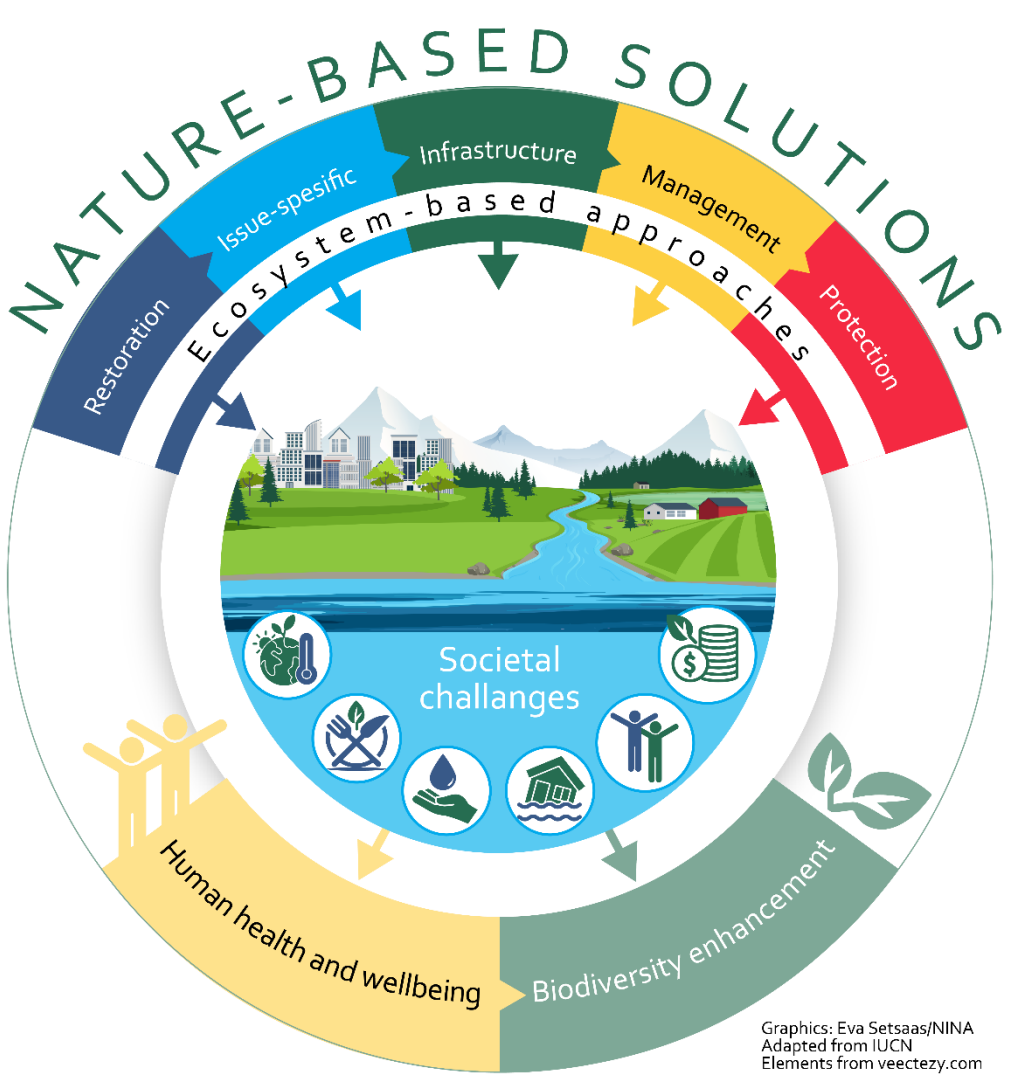
(Scherr et al. 2013)

Expanding the scale of agroforestry: From farm level to landscape level (and higher)



(EIP-AGRI 2016)

Expanding the scope of agroforestry: From commodities to multiple values of nature





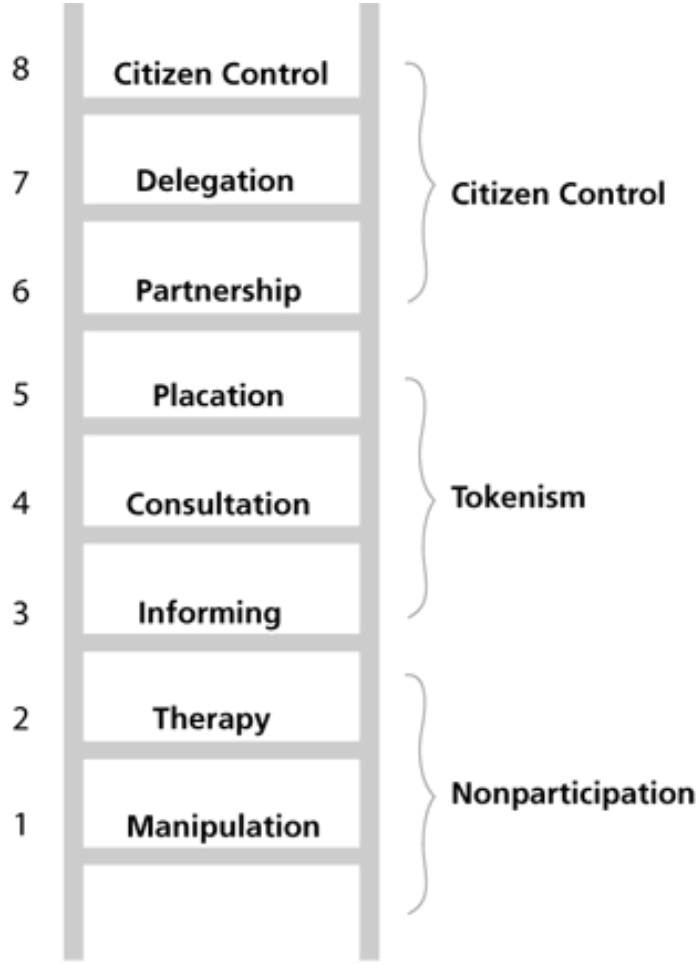
(Raymond et al. 2017)

The social–ecological ladder of agroforestry ambition

- Agroforestry goals are expanding **from single agroforestry practices to landscape and policy transformation**.
- Increasing ambition means addressing both **broader scope and scale**.

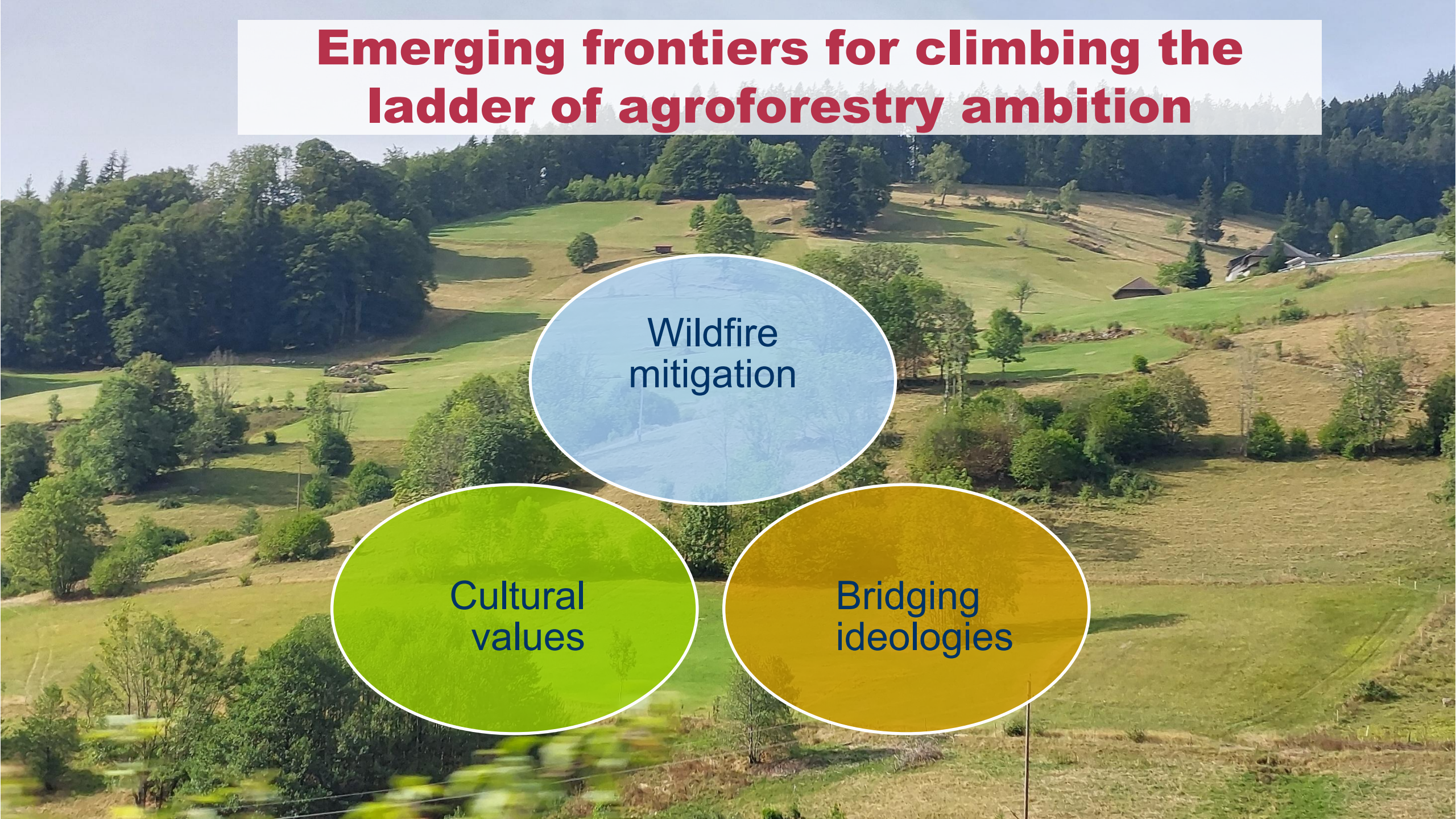


(Gann et al. 2019)



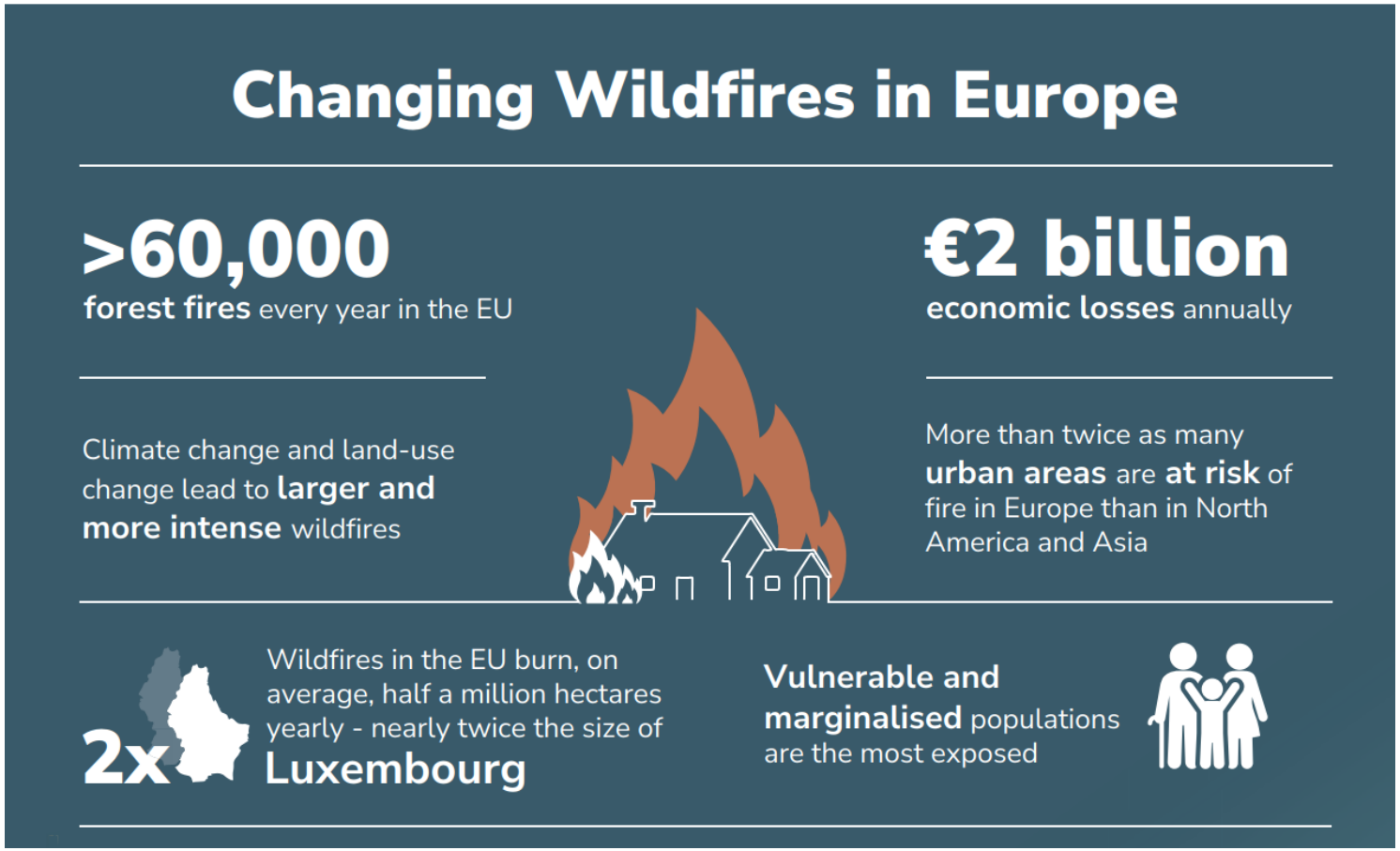
Arnstein's Ladder (1969)
Degrees of Citizen Participation

Emerging frontiers for climbing the ladder of agroforestry ambition



Frontier 2 – Wildfire mitigation: The challenge


(F. Pulido)



"Extensive monocultures and poorly managed landscapes exacerbate wildfire risk. Transitioning to multifunctional landscapes with mixed land uses can improve fire resistance while supporting biodiversity, agriculture, and forestry." *(EASAC 2025)*

Wildfire mitigation: Mediterranean fire-resilient agroforestry landscapes

"…agroforestry areas had fewer wildfire incidents than forests, shrublands or grasslands, providing evidence of the potential of agroforestry to reduce fire risk and protect ecosystems."

(Damianidis et al. 2020)



(F. Pulido)

Wildfire mitigation:
Reducing wildfire risk through multi-benefit land use



How Wine, Truffles and Honey Could Help Europe Fight Wildfires

Countries are learning that the finer things in life sometimes have a serendipitous side benefit.

Listen · 7:52 min Share full article 55

The New York Times

- Promote the use of **mosaic landscape structures** to reduce fuel continuity.
- Foster **agroforestry**, **extensive livestock farming**, and **rewilding**.
- Manage biomass through **prescribed burn**, **grazing**, and **mowing**.
- **Restore degraded ecosystems** using native species.

(EASAC 2025)

EUROPEAN COMMISSION

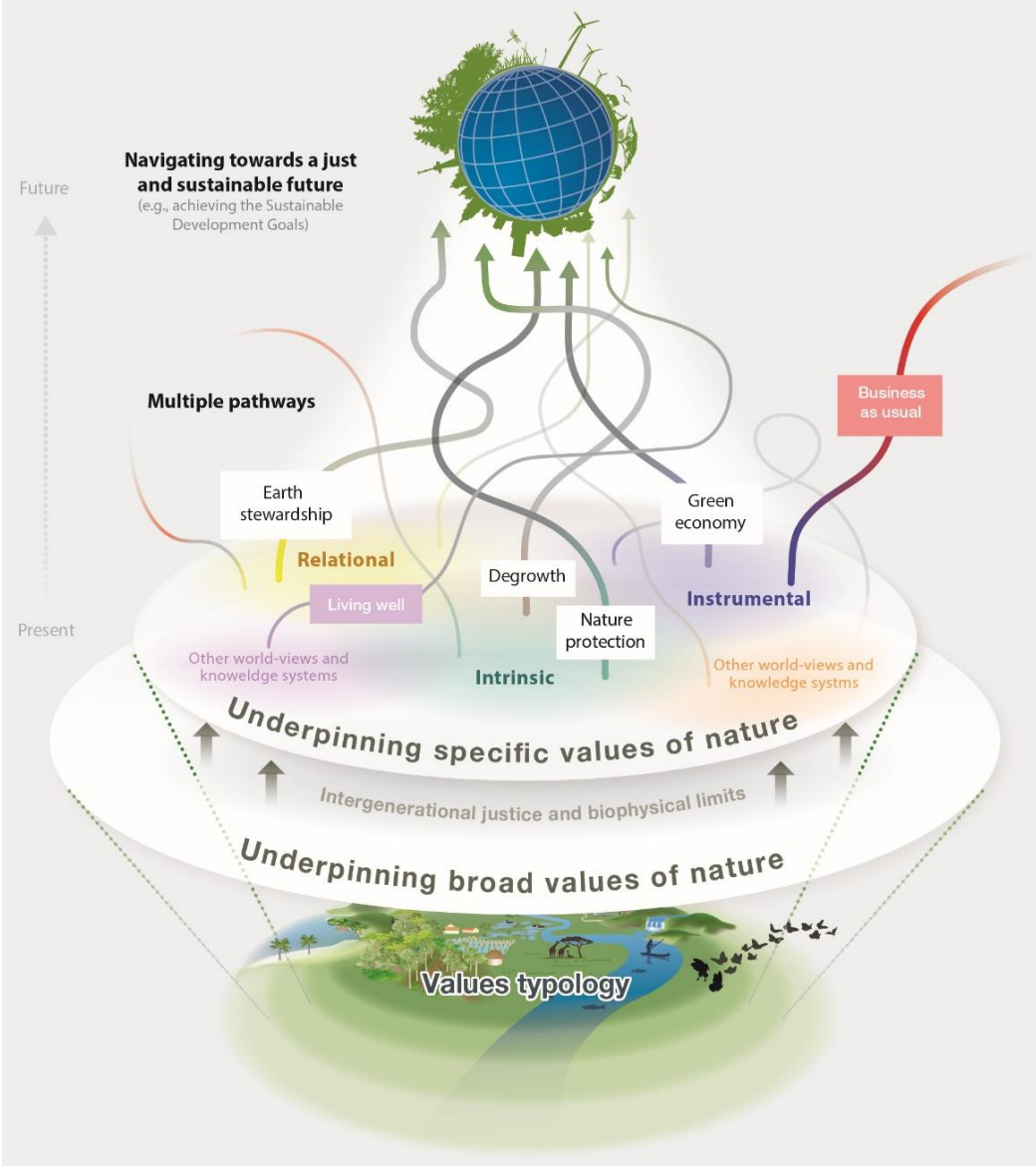
Brussels, 25.3.2026
COM(2026) 330 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

on integrated wildfire risk management

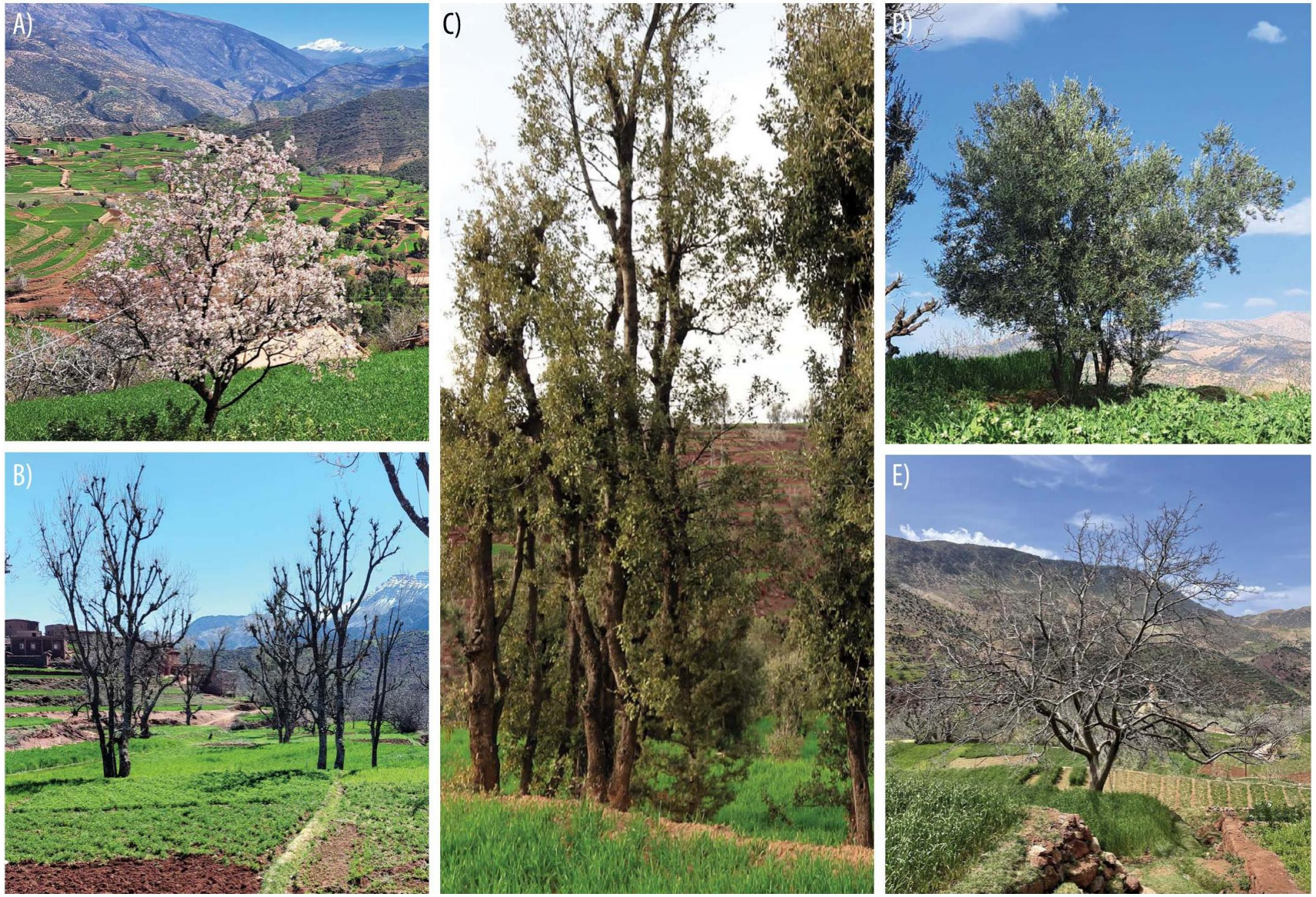
Frontier 2 – Cultural values: The challenge

"Biodiversity is being lost […] faster now that at any other point in human history. This is largely because our current approach to political and economic decisions does not sufficiently account for the diversity of nature's value."
(A.M. Hernández Salgar, IPBES 2022)



(IPBES 2022)

Cultural values:
Farm trees as cultural keystone species in Morocco



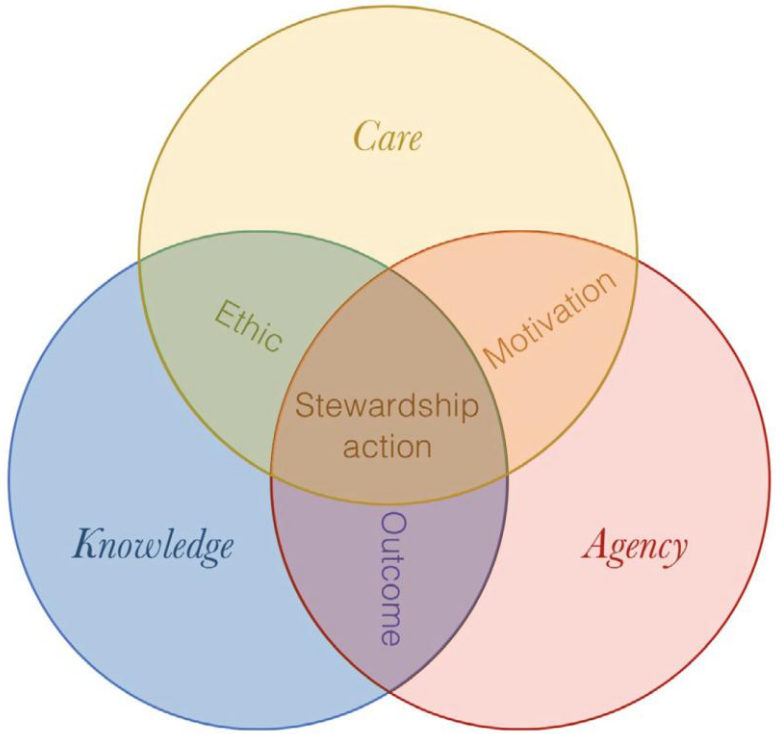
(Mobarak et al. 2025)

Developing agroforestry that fosters cultural values: A role for traditional and novel land-use systems

- Maintaining agroforestry systems that sustain rich people-nature relations.
- Developing (new) agroforestry systems that are culturally meaningful.
- Supporting community-based agroforestry.
- Linking to local land-use traditions.



(Focacci al. 2025)



(Enqvist et al. 2018)

Frontier 3 – Bridging the ideological divide: The challenge

Populism and polarisation affect European land use.

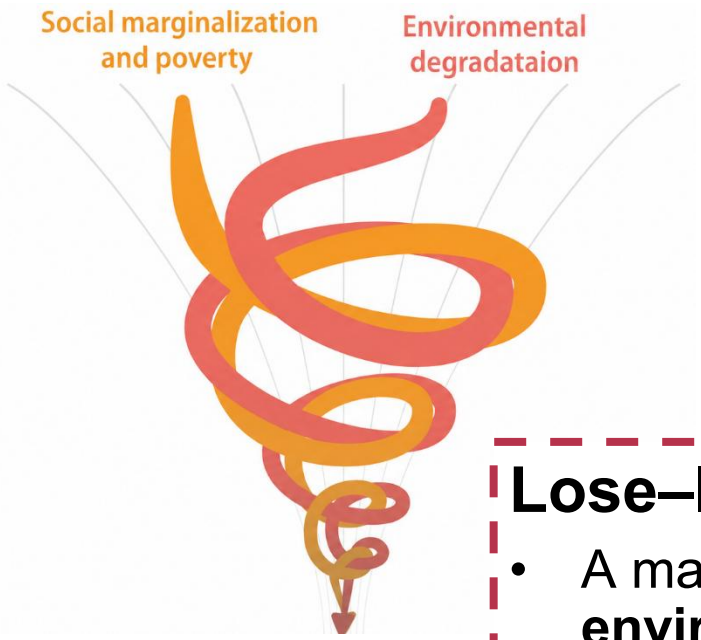
Environmental rollback in:

- Nature restoration regulation
- Pesticide reduction regulation
- Common Agricultural Policy environmental conditionality
- Etc.

(Durá-Alemañ & López-Bao 2025)



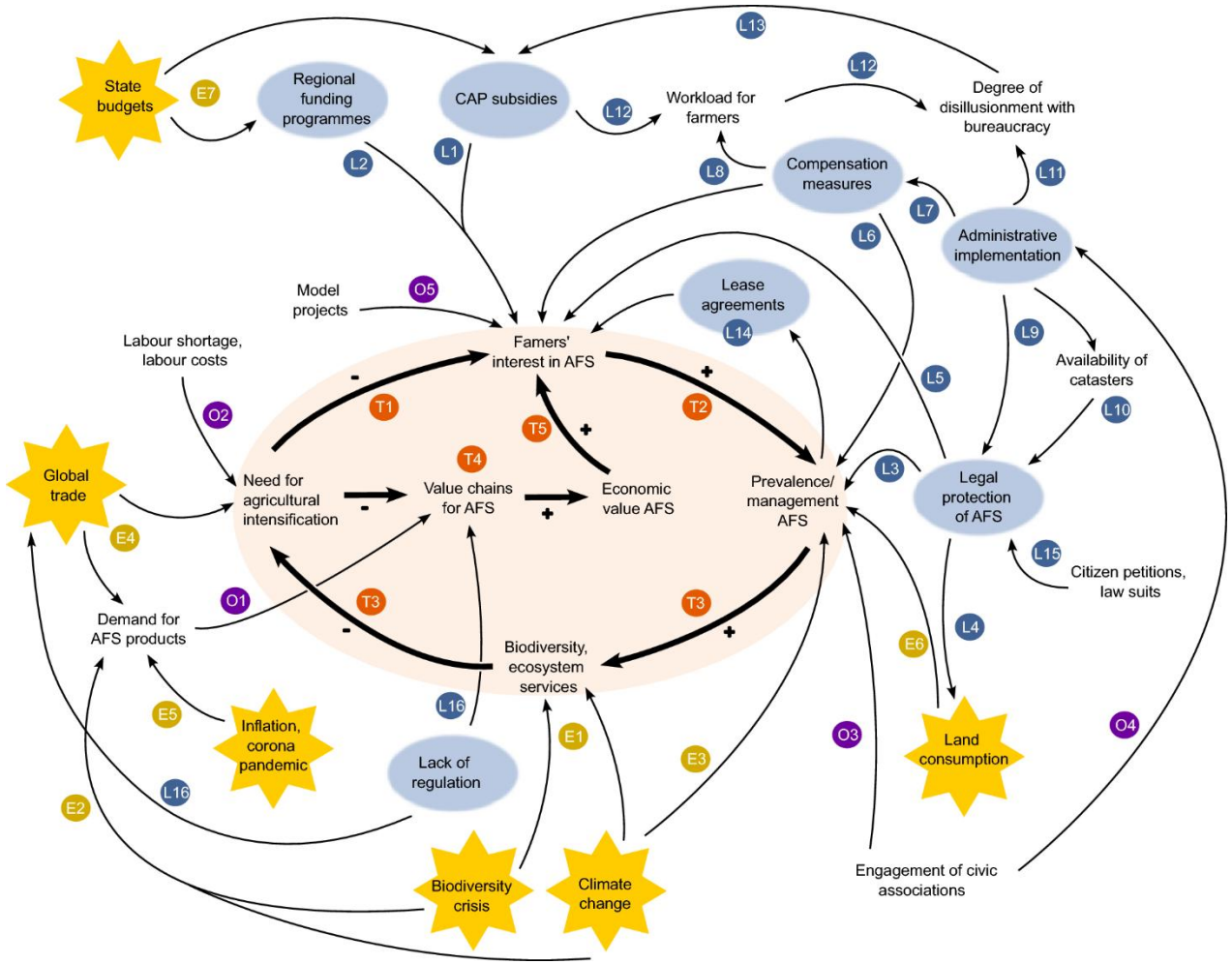
Bridging the ideological divide: European land-use is in a social-ecological trap



(Eriksson et al. 2023)

Lose–lose situation:

- A massive **agri-environmental crisis**
- A massive **farmer livelihoods crisis**
- A weakening of our **problem solving capacity**
- Decline in the **rule of law**
- A problem for our **democratic society**



(Klimke et al. 2025)

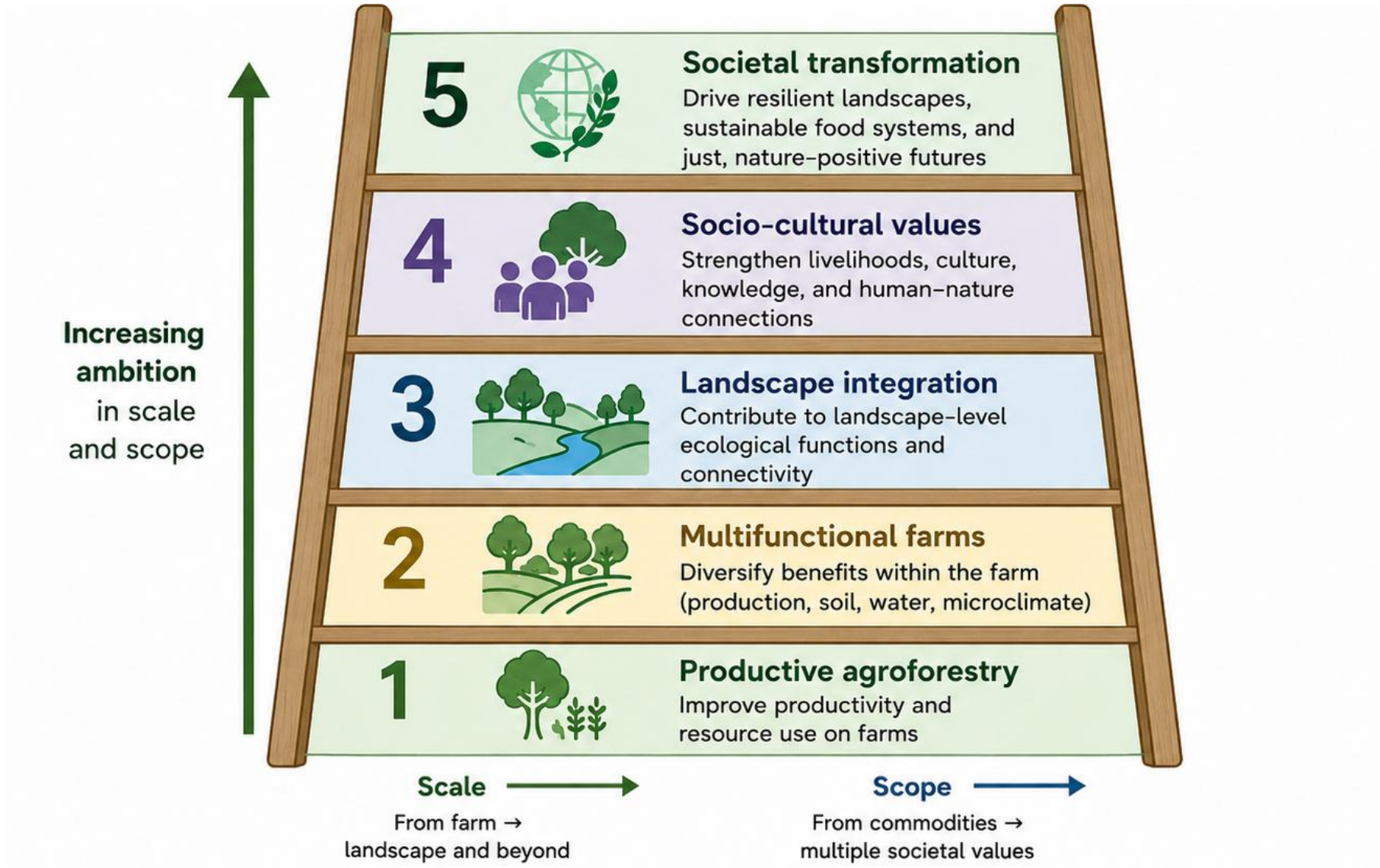
Connecting people (farmers, environmentalists, right/ left-wing etc.) through agroforestry: Five focal areas

Dimension	Recommended actions (examples)
Learning	Uncovering positive stories that link well with people's attachment to and concern for places
Regional heritage	Promoting and labeling locally important regional heritage sites and products
Care and stewardship	Increasing stakeholders' sense of agroforestry ownership by validating their skills and knowledge
Multifunctional production	Enhancing the consistency and synergies among coexisting policies, incentives, and funding instruments to promote multifunctionality
Collaboration	Developing strong networks among local collaborators and organizations, and facilitating them with adequate funding and technical support



(Polas et al. 2026)

Climbing the social–ecological ladder of agroforestry ambition



Take-home messages

- Traditional and novel agroforestry systems have **vast potential for multifunctionality**.
- Agroforestry can **expand in scale**, from farms to landscapes.
- Agroforestry can **expand in scope**, from commodities to broad societal values.
- The social-ecological ladder may be helpful for **expanding the ambition of agroforestry**.

Thank you!

medium.com/people-nature-landscapes



(M. Torralba)