Focus Paper on Agroforestry Systems as Natural Carbon Sinks

1. Definition Agroforestry Systems (AFS)

- **Agroforestry systems** are "land use systems in which trees are grown in combination with agriculture on the same land" (Article 23 of Regulation (EU) No. 1305/2013)

- **Agroforestry practices** include all forms of association of trees and crops (silvoarable systems) and/or animals (silvopastoral systems), on a parcel of agricultural land, whether in the interior of the parcel or on its edges (European Agroforestry Federation 2025).

- **Traditional agroforestry systems** on farmland include for instance (grazed) orchards, wood pastures, hedgerow systems, dehesas or montados.

- **Modern agroforestry systems** are systemically designed in lines or patterns on arable land or grassland in the way that the wooden structures are integrated in the agricultural production with minimum limitations for machinery and create ecological, economic and/or social benefits.

2. Importance of agroforestry systems for the climate and other public goods

- **Carbon sequestration** in biomass (wood, roots) and soil (more humus, leafy)
- Wood can **replace fossil fuels** and provide material for bioeconomy production
- Less/no use of **fertilizers/pesticides** on woody areas
- **Windbreaks effect**, around -94% reduction of wind erosion (Böhm et al., 2014)
- Reduction of **water erosion** through mechanical barrier and improved **soil structure** through roots, soil rest and humus accumulation (→ EU Soil Strategy)
- **Water** protection through filtering effect (water quality) (→ EU Water Framework Directive), better **water retention** under wooden strips (less evaporation) and improved microclimate with higher **humidity** due to more transpiration
- Higher **biodiversity** (up to (+60%) in silvoarable systems compared to cropland (Mupepele et al. (2021)) & potential to connect habitats (→EU Biodiversity Strategy).
- **Supporting bird populations** by providing critical habitats, food, shelter, nesting opportunities and movement corridors for woodland and edge-dwelling bird populations (up to +50% compared to open agricultural land (Edo et al., 2023)). (→ EU Birds Directive)
- **Animal welfare** (shade, fodder, protection from birds of prey)

- More diverse Agricultural **Landscapes** in Europe
- **Economic and social benefits** such as diversifying agricultural production and resilience, fostering rural development and green jobs.

3. Challenges for implementing more agroforestry systems

- **Regulations** on national levels between agriculture, nature conservation and forestry legislation are often not fully coherent or clearly defined, leaving the farmers in insecurity about the legal status of agroforestry systems.
- AFS imply **long-term planning** and a **long-term return of investment**, yet the market development for agroforestry products and long-term funding mechanisms are unclear
- Some AFS require high **investment costs** in money, labour and machinery
- Special **knowledge & skills** are needed to plan, plant, farm and harvest AFS
- Agroforestry systems on leased land need clear agreements in **leasing contracts** between the farmers and landowners on ownership, rights and duties.
- There are **potential conflicts with nature conservation** arising from:
    - agroforestry systems designed as monocultures (e.g. energy wood), threatening biodiversity and divers landscapes
    - invasive tree species suppressing native plants in nearby Natura 2000 sites
    - establishing trees on sensitive areas such as semi-natural grasslands or nutrient-poor grasslands, peatlands, or spring outlets
    - bird species of the open land like lapwing, skylark, and great bustard require wide, treeless landscapes for breeding and predator detection


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4. Necessary framework for the CAP and CAP-strategic plans

Step 1: Secure legal status of agroforestry systems on farmed land long-term

Wooden structures are crucial elements in agriculture landscapes that provide important eco-system services, can improve productivity and animal welfare. Therefore, the EU requests Member States to accept them in the Integrated Administration and Control System (IACS)/ Land Parcel Identification System (LPIS) as part of the agricultural area (Article 4, 3. of Regulation (EU) 2021/2115).

Additionally, the EU should make sure that these agroforestry types (according to EURAF typology) are eligible for funding in the Member States National Strategic Plans:

1. **Wood-pastures:** silvopastoral systems where scattered trees and shrubs are combined with permanent grasslands/pastures used for grazing livestock, canopy up to 80%, e.g. Dehesa (ES), Montado (PT), Hutweiden (DE, AT).
2. **Orchard-grazing**: silvopastoral systems on extensively used grasslands where livestock (e.g. cows, sheep, geese, poultry, pigs) graze under or between orchard trees.
3. **Orchard-cropping**: commercial fruit or nut orchards are intercropped with annual or perennial crops between tree rows.
4. **Alley-cropping**: silvoarable systems where rows of trees are planted at regular intervals with annual or perennial crops grown in the alleys between the rows, e.g. walnuts, timber, poplar, hazel.
5. **Alley-coppice**: silvoarable systems where coppiceable tree species (e.g., hazel, willow) are planted in rows and regularly cut back (coppiced) to provide biomass, fuelwood, or small timber, with crops/pasture managed in between.
6. **Food-forests:** multilayered agroforestry systems that mimic a natural forest structure, composed of perennial trees, shrubs, herbs, climbers, vine, groundcovers, e.g. in permaculture and regenerative agriculture.
7. **Agro-silvo-pasture** wooden structures, crops, and livestock on the same land unit.
8. **Woody-landscape-features:** Trees and shrubs integrated into agricultural landscapes that are not always directly productive, e.g. hedgerows, tree lines, windbreaks, riparian buffers, shelterbelts, field margins [Protected landscape elements]

Furthermore, the legal status of AFS must be clear and secured for the long-term:

- The legal security for agroforestry systems must be secured long-term, not just for the current CAP period.
- Agricultural land on which trees are established over a long period of time (e.g. for timber wood) must not lose its legal status as farmland and is turned into forests.
- Wooden structures in agroforestry systems can include trees, hedges and bushes.
- Protected landscape elements (hedges, individual trees, copses) included in conditionality requirements and recorded in the LPIS according to Regulation (EU) 2022/1172, Article 2(7)(d) should not be accepted as part of AFS that can be removed again.

Step 2: Introduce Eco-scheme on agroforestry

The maintenance and establishment of agroforestry systems must be covered by the yearly applied eco-schemes of the first pillar (Art. 31 Regulation (EU) 2021/2115) (e.g. CZ, PT, ES, IT, SK). Requirements should be for instance:

- Agroforestry systems do not include invasive plant species
- The wooden areas cover a minimum and maximum percentage of the farmed parcel
- There should be a flexibility in planting design to accommodate site-specific factors

- New wooden structures on the sides of fields are accepted as part of the AFS
- AFS planned on locations where they can potentially cause harm for the ecosystem or species, require a permission from the nature conservation authority
- Harvesting takes only place in the winter month
- Not all trees are harvested at the same time to keep up ecologic benefits

Step 3: Agri-Environmental and Climate Measures for agroforestry systems

To further promote agroforestry systems the Member States should offer Agri-Environmental and Climate Measures ((Art. 70 Regulation (EU) 2021/2115)) for agroforestry systems with high impact for climate and ecosystem services, e.g.

- Diverse systems with multiple tree species and types of agroforestry systems
- Systems with native/old species
- Systems that connect biotopes (Natura 2000 network) with adequate species or complements regional conservation priorities and species-specific needs.
- Systems in areas of high relevance, e.g. plains with little structural elements that suffer from wind erosion
- Wide wooded strips / multiples rows with a minimum width of 5 meters
- Wooden areas combined with flowering strips
- Structures in woodland strips, e.g. deadwood from pruning, piles of stones
- No use of pesticides in the wooded strips

Step 4: Initial funding & value chains

- Funding for investment costs (planning costs, planting including trees, tree protection, labour costs), with staggered funding depending on complexity and ecologic benefits.
- Higher funding for agroforestry systems with high nature value, e.g. orchards, woody-landscape-features, wood pastures, food forests and agro-silvo-pasture.
- Foster value chains, including short food supply chains and research for agroforestry products (biomass & food).
- Funding for monitoring: Long-term monitoring of bird populations in agroforestry landscapes are necessary to adapt management and policy strategies accordingly.

Step 5: Offer advice on agroforestry systems

Land managers, policymakers, and conservationists should work collaboratively to ensure that agroforestry supports both, climate resilience and biodiversity.
Thus, the National Strategic Plan should include attractive financing instrument that enables agroecology consultants to advise farmers on agroforestry systems. These should be eligible, not only for farming advisory services but also for qualified NGOs like Landcare(-like) organizations and model farmers. The consultation should not exclusively focus on CAP measures and legal requirements. It should rather be a holistic approach including planning the systems on site and education on soil and water management as well as biodiversity.