



Guidelines on Biodiversity-Friendly Afforestation, Reforestation and Tree Planting

DG ENV D.1 Land use & Land Management



Context

- Part of **Biodiversity Strategy** objective

‘Increasing the quantity of forests and improving their health and resilience’

- **Forest strategy:** ‘Re- and afforestation of biodiverse forests’
- Facilitate the 3 billion additional trees pledge
- Support Nature Restoration Law, Certification Framework for Carbon Removals and the Soil Mission
- UN Convention on Biological Biodiversity



Process: a collaborative approach

- Prepared in active dialogue with Member States Experts and key stakeholders (Forest & Nature expert group)
- 3 years process, eight “rounds”
- Voluntary character – designed to complement regulatory frameworks and trigger discussions for further developments at Member States level

Outline



Part 1:
**Forest
Ecosystems**



Part 2:
Urban Areas



Part 3:
**Agricultural
Land**



Part 4:
Financing

Outline



PART 1 – Forest ecosystems

- Recommended actions **BEFORE-DURING-AFTER** afforestation and reforestation
- Beyond Planting: **Natural Regeneration**



PART 2 – Tree planting in urban ecosystems

- Tree planting in urban ecology
- Target different types of green spaces
- Promoting Ecosystem services
- Monitoring and adaptive management

Outline



PART 3 – Tree planting in agricultural land

- Benefits and Examples of Agroforestry
- Key elements of Agroforestry



PART 4 – Financing Afforestation, Reforestation and Tree Planting

- CAP, Cohesion policy, LIFE, Horizon Europe,
- Technical support instruments

The guidelines promote...

- ... tree planting that supports **biodiversity, climate change mitigation and resilience** without neglecting socio economic benefits
- ... **integration** of biodiversity-friendly afforestation, reforestation and tree planting into wider conservation and restoration efforts
- ... **ecological principals** and **nature-based solutions** adapted to different ecosystems
- ... **adaptive nature management**
- ... **mutual information, understanding** and **cooperation** between affected parties



Forest Ecosystems

Part 1

Four main cases/situations:

1. Reforestation after planned tree harvesting
2. Reforestation after natural disturbances (storms, droughts, pests, fires)
3. Restoration/enrichment planting in order to diversify forest stands
4. Afforestation (conversion of agricultural, industrial or urban land into forest or wooded land)



Recommended actions BEFORE Afforestation and Reforestation

Part 1: Forest Ecosystems

Before Afforestation and Reforestation Part 1



Choose the correct area

avoid wetlands (e.g. peatland) and areas with high climate mitigation potential, consider landscape ecology, land owners...

Evaluate the Biodiversity and soil

identify habitat and soil type/health

Choose the right species

local adaptation, CC resilience, native, mixing of species...

Adapt nurseries

promote production of native species and local ecotypes



Evaluate the biodiversity and soil

- Habitat, Soil type and soil health = decisive for species choice
- Change of habitat beneficial for BD?
- Soil pollutants, contaminants, water holding capacity, nutrient availability...



Choose the right species to foster BD Part 1

- Adapted to local ecological, climatic conditions and habitats
- Focus on native species, avoid invasive alien species
- Take CC into account (changing environmental conditions, uncertain forest dynamics...)
- Promote the mixing of species -> structural heterogeneity, risk diversification

The Benefits of Mixing species Excursus



Biodiversity

- Diverse species/ structures
- Broadleaved vs conifers

Climate Change

- Improved pathogen resistance
- Improved resilience following disturbance

Productivity

- Higher stability
- “Insurance” effect



Recommended actions DURING Afforestation and Reforestation

Part 1: Forest ecosystem services

During Afforestation and Reforestation Part 1



Sustainably use and nurture soil, protect the water cycle

- High diversity of fungi is prerequisite for healthy forests
- Avoid subsoil displacement and the use of nitrogen fertilizers
- Manual planting when possible
- Avoid heavy machinery (especially in wet conditions)
- ...

Protect habitats

- Maintain pioneer species in open forest and bare soil
- Keep deadwood (varying in size and stage)
- Maintain diversity of stands
- Promote existing regeneration and understory
- Avoid whole tree harvesting (Reforestation)
- ...



Recommended actions AFTER Afforestation and Reforestation

Part 1: Forest Ecosystems

After Afforestation and Reforestation



- **Monitoring** is essential
- Control competing vegetation mechanically
- Set measures to achieve a Biodiversity beneficial grazing pressure
- Protect existing or expected seedlings



Beyond Planting: Natural Regeneration

Part 1: Forest ecosystems

Natural Regeneration



- Preserves genetic diversity -> resistance and vitality
- Local adaptation
- Promotes spatial and temporal heterogeneity
- Artificial Regeneration may be important in post-agricultural/industrial land, after large scale disaster accompanied with lack of suitable seed source
- Enrichment planting if no natural regeneration of desirable species is possible/desirable

Summary of Highlights: **Forest Ecosystems**

- The right species, at the right time and place! (consider ecological conditions, biodiversity impact and socio-ecological context).
- Mix tree species to biodiversity enhancement, climate change adaptation (resistance and resilience) and productivity.
- Avoid adverse effect of afforestation and reforestation actions on soil, water cycle, etc... and protect existing habitats.
- Set management actions to ensure afforestation/Reforestation success: mechanical weeding, balance grazing pressure.
- Natural Regeneration to foster local adaptation and genetic diversity
Supplementary enrichment planting.





Tree Planting in Urban Ecosystems

Part 2

Ecosystem Services & the EU Urban Agenda

Excursus



Trees feature key elements:

- Air quality – filtering capacity
- Urban Mobility – facilitate accessible and resilient open public spaces
- Culture and heritage
- Climate adaptation and energy transition – mitigate UHI effect
- Social aspects



ve management

an ecosystem projects
banisation can have lag time

monitor and review project
gly

Green urban planning and management tools



- Trees as one element of urban green
- integrate environmental spatial planning in urban areas – consider effect of city on environment
- Integrate BD and CC objectives in urban green and innovation plans



Conservation and enhancement of biodiversity in urban areas Part 2



Biodiversity in spatial planning

Strengthen corridor function and connectivity, protect remnant patches, Increase quality of surrounding matrix

Increase the structural complexity of vegetation

Diversify tree species, enhance (vertical) structural diversity, increase ground- & mid-storey density

Increase habitat resources

Conserve and manage trees adequately -> veteran trees

Choose the right species for biodiversity

native and locally adapted species, habitat value of the species, species diversification

Complementary measures

Avoid pesticides and inorganic fertilizers, reduce pruning and mowing...



Promoting Ecosystem Services in Urban Area

Part 2



Ecosystem services and urban agenda

Trees are key elements

Minimise disservices

Consider allergy-causing potential in relation to distribution of trees

Choose the right species to provide ecosystem services

Context specific

Involve citizens in urban areas
maintenance and monitoring



Target different types of urban green spaces

Part 2



- Parks
- Residential and private gardens
- Informal green spaces
- Streets and squares – corridor function
- other areas – rooftops, parking lots, balconies...



Monitoring and adaptive management Part 2



- To track success and failure of urban ecosystem projects
- Long term monitoring – effects of urbanisation can have lag time
- Adaptive management – iteratively monitor and review project outcome -> adjust actions accordingly



Highlights: Part 3 Tree Planting **Urban Ecosystems**



- Trees are an important element of biodiversity conservation and enhancement in urban areas (Enhance Connectivity and Corridor function)
- The choice of the right tree species is essential (provide ecosystem services and avoid disservices) consider distinctive growing conditions in urban environments.
- Safeguard veteran trees and use biodiversity-friendly management approaches for urban green areas.
- Target different types of urban green spaces (parks, streets, squares...)



ARTIFICIAL AREAS

The potential for trees in
EU cities is around 4 million
hectares, representing:

2,1 billion trees

Source: SWD(2021) 651

Tree Planting in Agricultural Land

Part 3





Trees in Agricultural Land

Unsustainable agriculture as a main driver of biodiversity loss ->

Agroforestry:

- Synergistic benefits for agricultural production and biodiversity and ecosystem services
- increased land use efficiency and income diversification
- Creates **heterogenous agricultural landscapes**

Mosaics of well connected and diversified habitats in different ecological conditions



Agroforestry benefits ecosystem services by...

- Improving overall biodiversity
- Creating buffer zones (e.g. riparian buffers)
- Establishing biological corridors -> connectivity
- Reclamation and rehabilitation of abandoned agricultural land
- Carbon sequestration (CC mitigation)
- Creating micro-climates (CC adaptation)

Agroforestry systems and practices



Tree location	Agroforestry system	Agroforestry practice	
		Agricultural land	Forest land
Trees inside parcels	Silvopastoral agroforestry	1. Wood pasture	9. Forest grazing
	Silvoarable agroforestry	2. Tree alley cropping 3. Coppice alley cropping 4. Multi-layer tree-gardens	10. Multi-layer tree gardens
	Permanent crop agroforestry	5. Orchard intercropping 6. Orchard grazing	
	Agro-silvo-pasture	7. Alternating cropping and grazing	
Trees between parcels	Tree landscape features (addressed by CAP conditionality rules)	8. Tree landscape features: protected hedges, scattered individual trees, trees in line, small groups of trees	
Trees in settlements	Urban agroforestry	Home gardens, allotments, etc.	



Agroforestry systems and practices

Agroforestry -> restore ecology of the area

Trees inside parcels: wood pasture, tree/coppice alley cropping, multi-layer-tree gardens, orchard intercropping, orchard grazing, alternating cropping and grazing, forest grazing

Trees between parcels: orchard intercropping/grazing, alternating cropping and grazing

Trees in settlements: home gardens, allotments, etc...

Recommendations for **designing and managing** agroforestry systems



- Interdependencies and relationships between trees and crop/pasture
- Consider future management interventions
- Scale of the plot
- Temporal variability of trees and crops (shading)
- Select vegetation that creates synergistic benefits
- Protect young trees from animals



AGROFORESTRY

Potential for 13 million hectares
of planting on agricultural land,
representing

3,13 billion trees

Source: SWD(2021) 651



Financing Afforestation, Reforestation and Tree Planting

Part 4

Financing Afforestation, Reforestation and Tree Planting



- Guidance booklet on financial sources to be produced in 2023
- Common Agricultural Policy (**CAP**) -> European Fund for Rural Development (EAFRD) (up to 100% reimbursed)
- **Cohesion policy** -objective 2; “A greener, low-carbon transitioning towards a net zero carbon economy and resilient Europe”
- **LIFE** – dedicated exclusively to environment, nature and climate action
- **HORIZON EUROPE** funds research and innovation projects
- Guidelines on funding options for the environment published in 2022

Thank you



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