Guidelines of ML management and Success stories

Identifying Marginal Lands in Europe and strengthening their contribution potentialities in a CO2 sequestration strategy

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European Framework:
Forest and adaptation to climate change

Forest and Humans

Forests are essential for human health, as they are important habitats rich in biodiversity, provide primary materials (paper, cork and furniture), revitalize the rural environment, regulate the air we breathe, clean the water we drink and are the key to combating climate change (European Commission, 2021a)
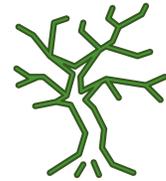
Vulnerability of forests

Climate change continues to negatively affect forests, particularly, but not only, in areas with monospecific and even-aged stands.
Other pressures: pests, pollution and disease, and affects forest fire regimes.

EU forest strategy for 2030

Consists of improving monitoring to better assess the state of our forests, reversing negative trends, duplicating our efforts to protect and restore forest biodiversity to ensure the resilience of forests, increasing forest cover

Climate neutral

For this transition to climate neutrality to be successful, we need our existing forests to be larger, more diverse and healthier, increasing carbon capture and storage, halting species and habitat loss, and reducing the effects of air pollution on human health.

Plant 3 billion trees by 2030

Restoring damaged ecosystems through reforestation or creating new forests through sustainable and ecologically balanced afforestation while taking due consideration of environmental, economic and social values (European Commission, 2021b).

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Guidelines of ML management

Proposal for the use of marginal lands: afforestation and reforestation
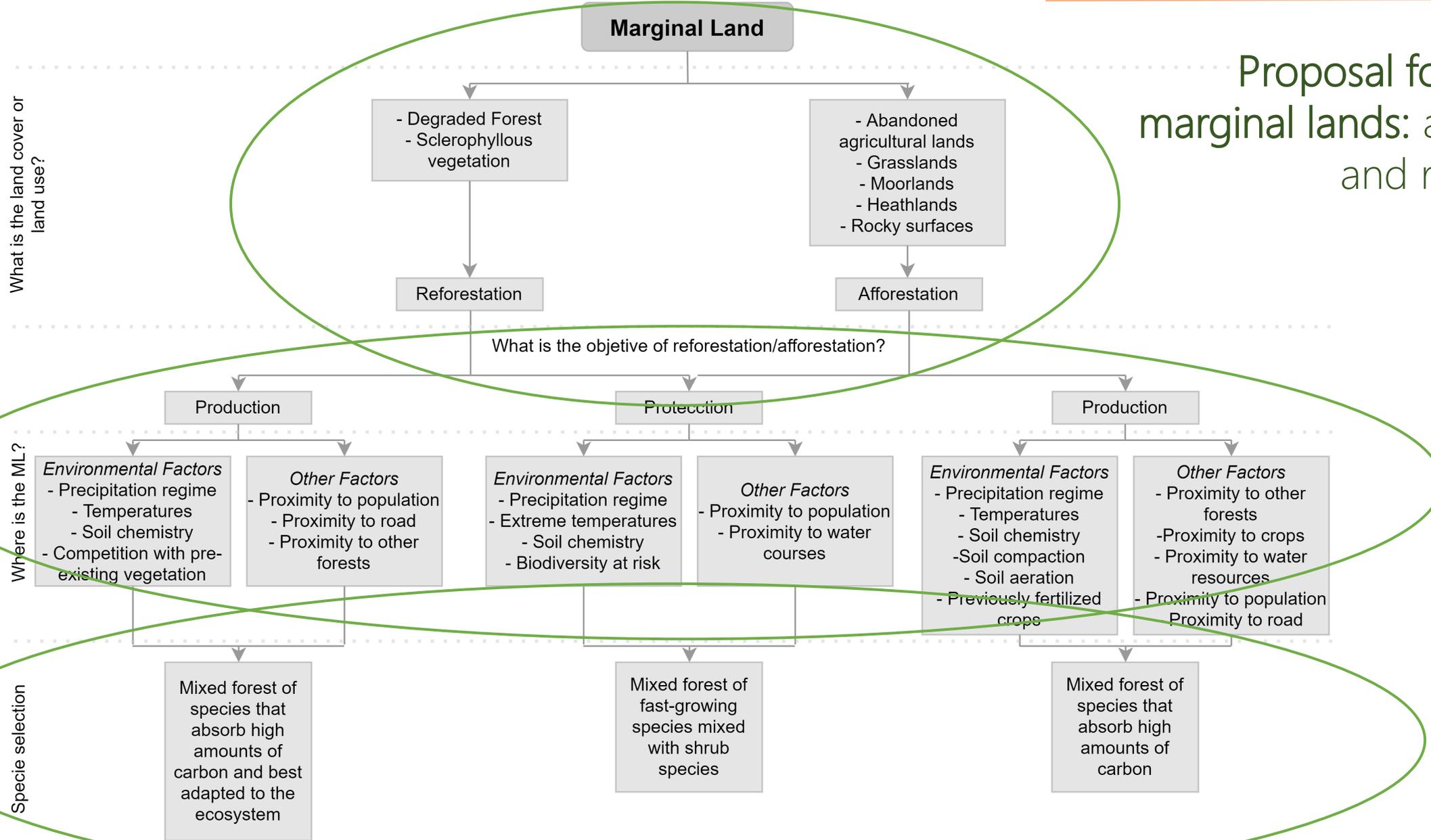
What is the land cover or land use?

Marginal Land

- Degraded Forest
- Sclerophyllous vegetation

- Abandoned agricultural lands
- Grasslands
- Moorlands
- Heathlands
- Rocky surfaces

Reforestation

Afforestation

What is the objetive of reforestation/afforestation?

Production

Protección

Production

Where is the ML?

Environmental Factors
- Precipitation regime
- Temperatures
- Soil chemistry
- Competition with pre-existing vegetation

Other Factors
- Proximity to population
- Proximity to road
- Proximity to other forests

Environmental Factors
- Precipitation regime
- Extreme temperatures
- Soil chemistry
- Biodiversity at risk

Other Factors
- Proximity to population
- Proximity to water courses

Environmental Factors
- Precipitation regime
- Temperatures
- Soil chemistry
- Soil compaction
- Soil aeration
- Previously fertilized crops

Other Factors
- Proximity to other forests
- Proximity to crops
- Proximity to water resources
- Proximity to population
- Proximity to road

Specie selection

Mixed forest of species that absorb high amounts of carbon and best adapted to the ecosystem

Mixed forest of fast-growing species mixed with shrub species

Mixed forest of species that absorb high amounts of carbon

Guidelines of ML management

- ✓ **58** guidelines

- ✓ **Pan-European level** in reforestation / afforestation programs on marginal lands with the main objective of *carbon sequestration and reduction of CO2 emissions*.

- ✓ A set of recommendations for **voluntary use** and have been developed for different stakeholders.

- ✓ **4 Sections**: *General, Socio-economic, Environmental and Specific forest management.*

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...n a CO₂ sequestration strategy

Guidelines of ML management
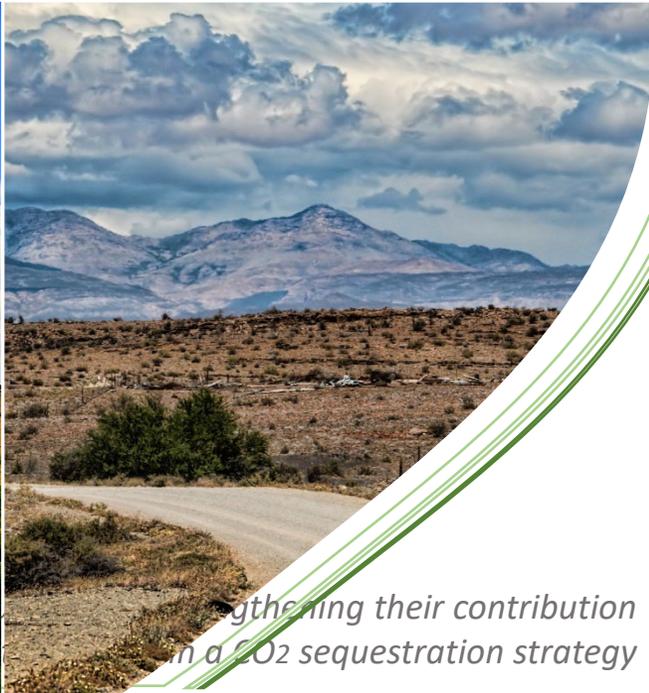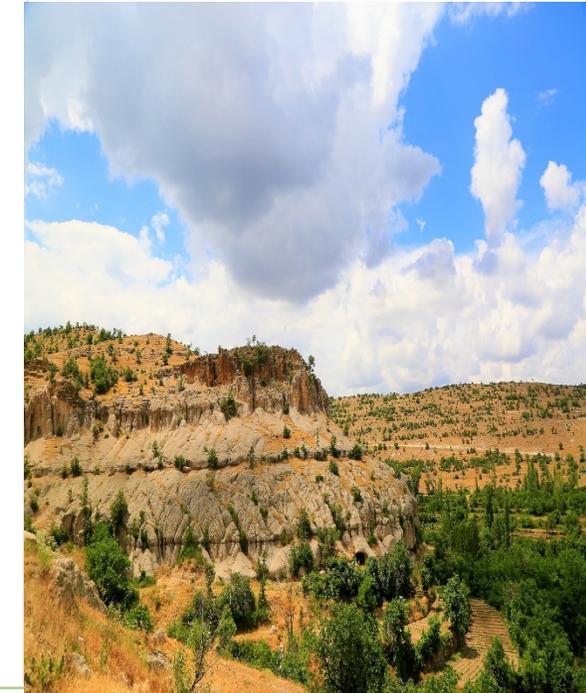
Some examples of MLs management guidelines

- ✅ **General: Pan-European criteria and indicators for sustainable forest management** should be used as a general framework for ML reforestation/afforestation programs. All criteria taken in the reforestation/afforestation project should be consistent with **the economic, social, and environmental approaches proposed by the New EU Forest Strategy for 2030.**

- ✅ **Socio-economic:** Reforestation/afforestation projects should follow **circular economy principles**, promote **rural development**, **and cross-sectoral coherence** between the forest and other relevant sectors such as agriculture, industry and energy.

- ✅ **Environmental:** When selecting sites for reforestation/afforestation projects, **environmental impacts on areas of high ecological value should be taken into account**. If the area involves the conversion of shrub and grassland areas to a forest, **the impacts on the existing fauna and flora will be analyzed.**

Some examples of MLs management guidelines

✅ **Specific forest management:** When the area to be reforested or afforested should be very large, a **silvicultural management plan should be drawn up to control the carbon balance accumulated in the forest.**

✅ **Specific forest management:** In **agricultural areas**, **depending on the characteristics of the terrain and the level of soil compaction**, it will be necessary to undertake tillage, linear subsoiling, full subsoiling, hand augering, helicoidal augering or backhoe augering.

✅ **Specific forest management: Native species should be chosen**, whose seed or planting stock comes from varieties and ecotypes that are well adapted to the project area, thus supporting diversity and resilient adaptation to climate change.

Deliverable 5.4

Success stories. Satellite monitoring of marginal lands

Author	Title	Remote sensor / mission
W. Ray *et al.* 1993	Monitoring land use and degradation using satellite and airborne data	polarimetric SAR & Landsat-5 TM
Witmer and O'Loughlin 2009	Satellite data methods and application in the evaluation of war outcomes: abandoned agricultural land in Bosnia-Herzegovina after the 1992–1995 conflict	Landsat-5 TM & Quickbird
Löw *et al.* 2015	Mapping abandoned agricultural land in Kyzyl-Orda, Kazakhstan using satellite remote sensing	Landsat-5 TM, Landsat-8 OLI & RapidEye

Carbon sequestration potential of marginal lands using remote sensing

Potter *et al.* 2007	Satellite-derived estimates of potential carbon sequestration through afforestation of agricultural lands in the United States	AVHRR sensor
DiRocco *et al.* 2014	Accountable accounting: Carbon-based management on marginal lands	-

MLs identification & classification projects

Partners	Project	Project website	Duration
Fachagentur Nachwachsende Rohstoffe EV (Germany) and 6 partners more	Sustainable Exploitation of Biomass for Bioenergy on Land (Seemla)	https://www.seemla.eu/home/	2016-2018
Centre for Renewable Energy Sources and Saving (Greece) and 23 partners more	European project Marginal Lands for Growing industrialists (Magic)	https://magic-h2020.eu/	2017-2021

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Thank you for your attention!

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