

# Towards forests' sustainability and multifunctionality: are Portuguese forests on the right track?

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THIRD WORLD SYMPOSIUM ON SUSTAINABILITY SCIENCE AND RESEARCH  
IMPLEMENTING THE 2030 UNITED NATIONS AGENDA FOR SUSTAINABLE DEVELOPMENT



# How about? Towards forests' sustainability and multifunctionality?

- Decades of very intense use
- Abandonment
- Inaction & inadequate policies
- Most of the forest area is today formed by young or rejuvenated masses, with a very simplified biodiversity, which are particularly vulnerable to disturbances/pressures such as:

- Habitat conversion and degradation
- Climate change
- Pollution and nutrient enrichment
- Over-harvesting
- Invasive alien species
- Pests, parasites, insect infestations
- Soil erosion
- ...

IMPLEMENTING  
THE 2030  
UNITED  
NATIONS  
AGENDA FOR  
SUSTAINABLE  
DEVELOPMENT



GOAL OF THE MONTH

<https://www.un.org/sustainabledevelopment/>

Of this team?!

# Forests' sustainability and multifunctionality – TAKE ACTION

- **EU Biodiversity Strategy for 2030** (COM(2020) 380 final)
  - Protecting and restoring biodiversity and well-functioning ecosystems is therefore key to boost our resilience and prevent the emergence and spread of future diseases.
- **European Green Deal** (COM/2019/640 final)
  - Transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.

## EU Forest Strategy (2021)

Will have as its key objectives **effective afforestation, and forest preservation and restoration in Europe**, to help to increase the absorption of CO<sub>2</sub>, reduce the incidence and extent of forest fires, and promote the bio-economy, in full respect for ecological principles favourable to biodiversity

Forest ecosystems are under **increasing pressure**, as a result of climate change.

The EU's forested area needs to improve, both in **quality and quantity**

## State and outlook of Europe's environment in 2020

Viewed against Europe's long-term vision and complementary policy targets, it is clear that Europe is not making enough progress in addressing environmental challenges.

Past trends  
(10–15 years)




Outlook  
to 2030



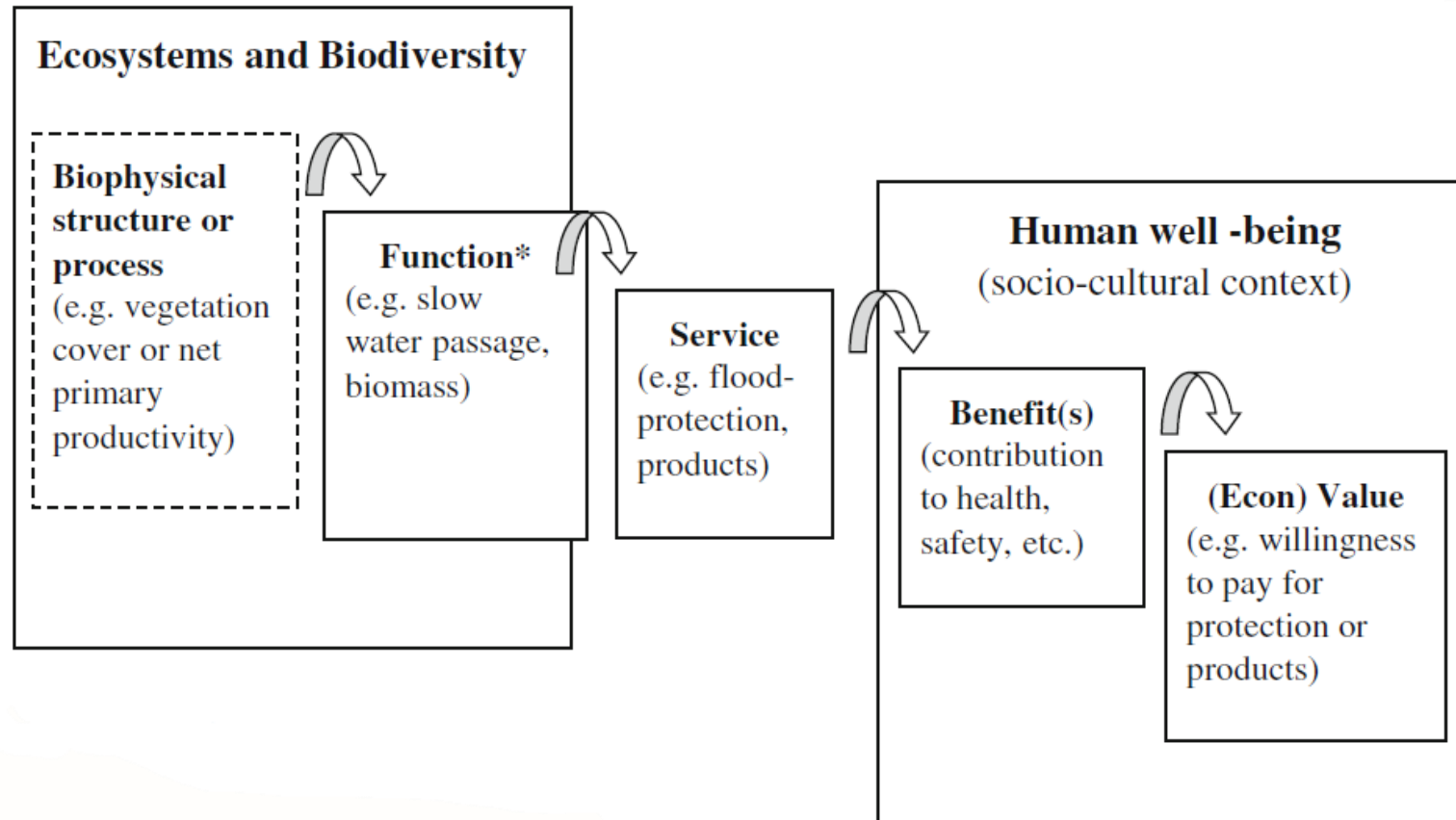
■ Improving trends dominate    ■ Trends show mixed picture    ■ Deteriorating trends dominate





There is growing demand for goods and services from forests, but information on the impacts of the dynamics and processes of these ecosystems in Europe is currently limited

# Biodiversity & Ecosystem services – is this the way?



*The relationship between biodiversity, ecosystem function and human well-being (adapted from Groot et al. 2002, after modification by Haines-Young and Potschin 2010)*



# Biodiversity & Ecosystem services – is this the way?

- **Ecosystem process** is “any change or reaction which occurs within ecosystems, physical, chemical or biological. Include decomposition, production, nutrient cycling, and fluxes of nutrients and energy (MA 2005).
- **Ecosystem function** that is a “subset of the interactions between biophysical structures, biodiversity and ecosystem processes that underpin the capacity of an ecosystem to provide ecosystem services (TEEB 2010).
- **ES** - “The benefits that people obtain from ecosystems - the direct and indirect contributions of ecosystems to human wellbeing” (TEEB 2010).

## PROVISIONING SERVICES

products obtained from ecosystems (e.g. food, fibre, fuel, water, genetic resources)

## REGULATING SERVICES

benefits obtained from the regulation of ecosystem processes (e.g. climate, floods, water purification, pollination)

## SUPPORTING SERVICES

necessary to produce other ecosystem services (e.g. soil formation, photosynthesis, nutrient cycling)

## CULTURAL SERVICES

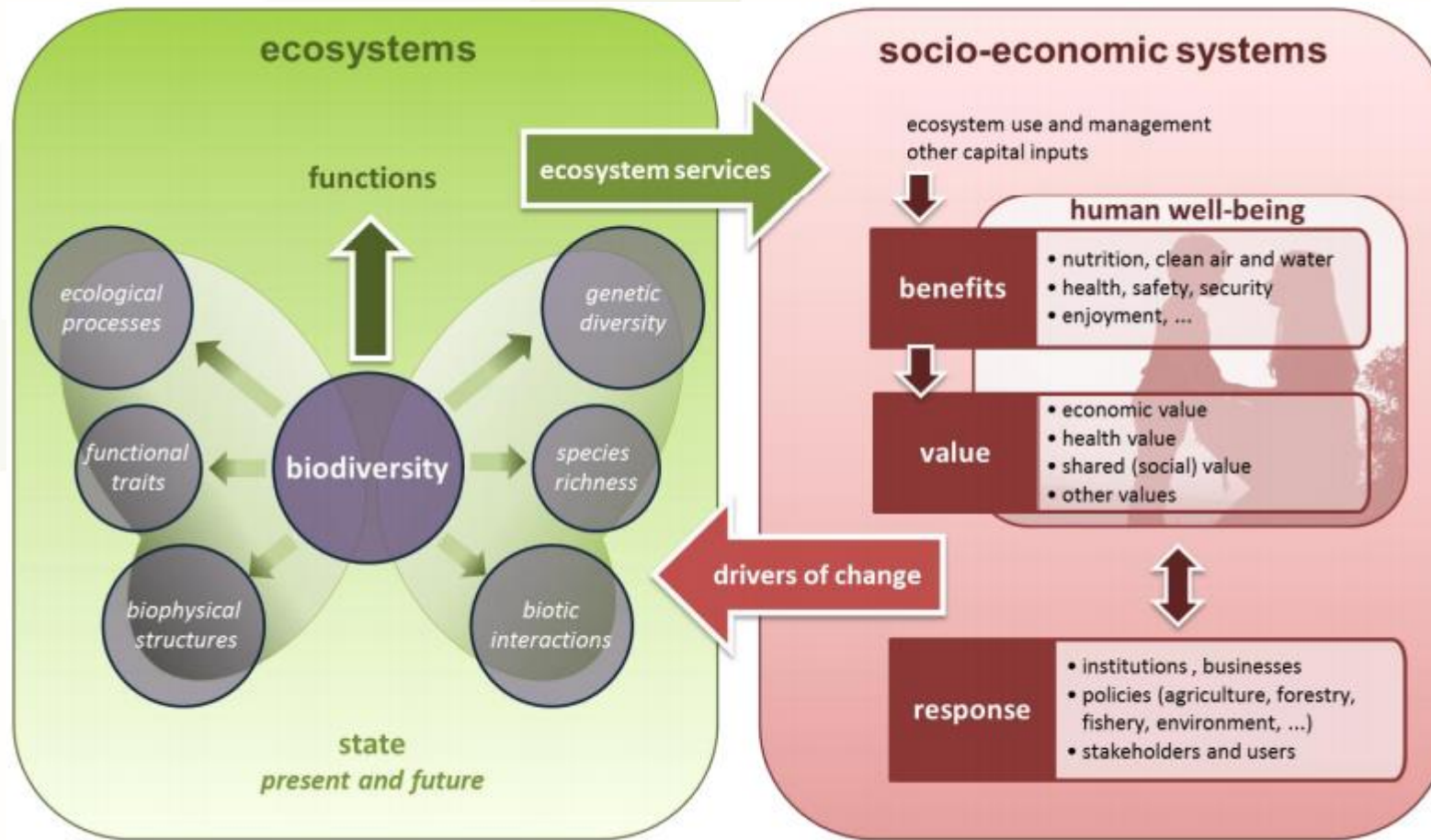
non-material benefits for people (spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences)

The **concept of ecosystem services has gained a strong political profile** during the last years.

Ecosystem services concept is already embedded in recent EU policies (environmentally-related) (e.g. Biodiversity Strategy 2020; the Invasive Alien Species Regulation).

Policies showing very high coherence are confined to the policy arenas that address natural ecosystems, forestry, or agriculture

*Conceptual framework for EU wide ecosystem assessments (MAES, 2013)*



Mapping and Assessment of Ecosystems and their Services: An EU ecosystem assessment



[Biodiversity Strategy](#)



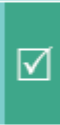









Called on Member States to map and assess the state of ecosystems and their services



# Biodiversity & Ecosystem services – is this the way?

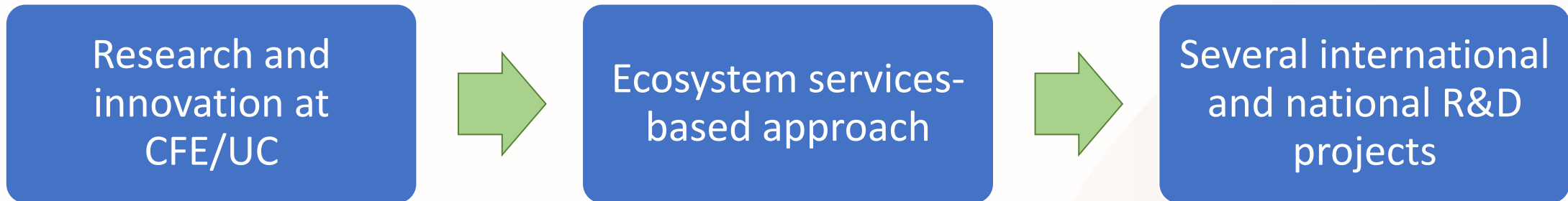
Europe is not on track to meet the 2020 target of maintaining and enhancing ecosystems and their services by establishing green infrastructure and restoring at least 15 % of degraded ecosystems. While Natura 2000 areas have a positive effect on ecosystem condition and biodiversity in surrounding areas, pressures remain high and the conservation measures undertaken are still insufficient (SOER 2020)

## Thematic summary assessment

Theme	Past trends and outlook		Prospects of meeting policy objectives/targets	
	Past trends (10-15 years)	Outlook to 2030	2020	
Terrestrial protected areas	 Improving trends dominate	 Developments show a mixed picture		Largely on track
EU protected species and habitats	 Trends show a mixed picture	 Developments show a mixed picture		Not on track
Common species (birds and butterflies)	 Deteriorating trends dominate	 Deteriorating developments dominate		Not on track
Ecosystem condition and <b>services</b>	 Deteriorating trends dominate	 Developments show a mixed picture		Not on track

- It is very clear that **more detailed information at finer scales of knowledge is required** to meet the needs of environmental protection and climate and energy policies, all in the context of the SDG as part of the United Nations 2030 Agenda.
- This involves:
  - Analysing (at the regional and local scale level) land uses and their evolution
  - Understanding (forest) management practices and their impact on the multifunctionality and resilience of the ecosystem.

That's why



<http://cfe.uc.pt/menu/researchProjects>





Multiforest

# MultiForest - The Multifunctionality of the Forest - Potential and Valorisation of Goods and Services of Portuguese Forest Ecosystems

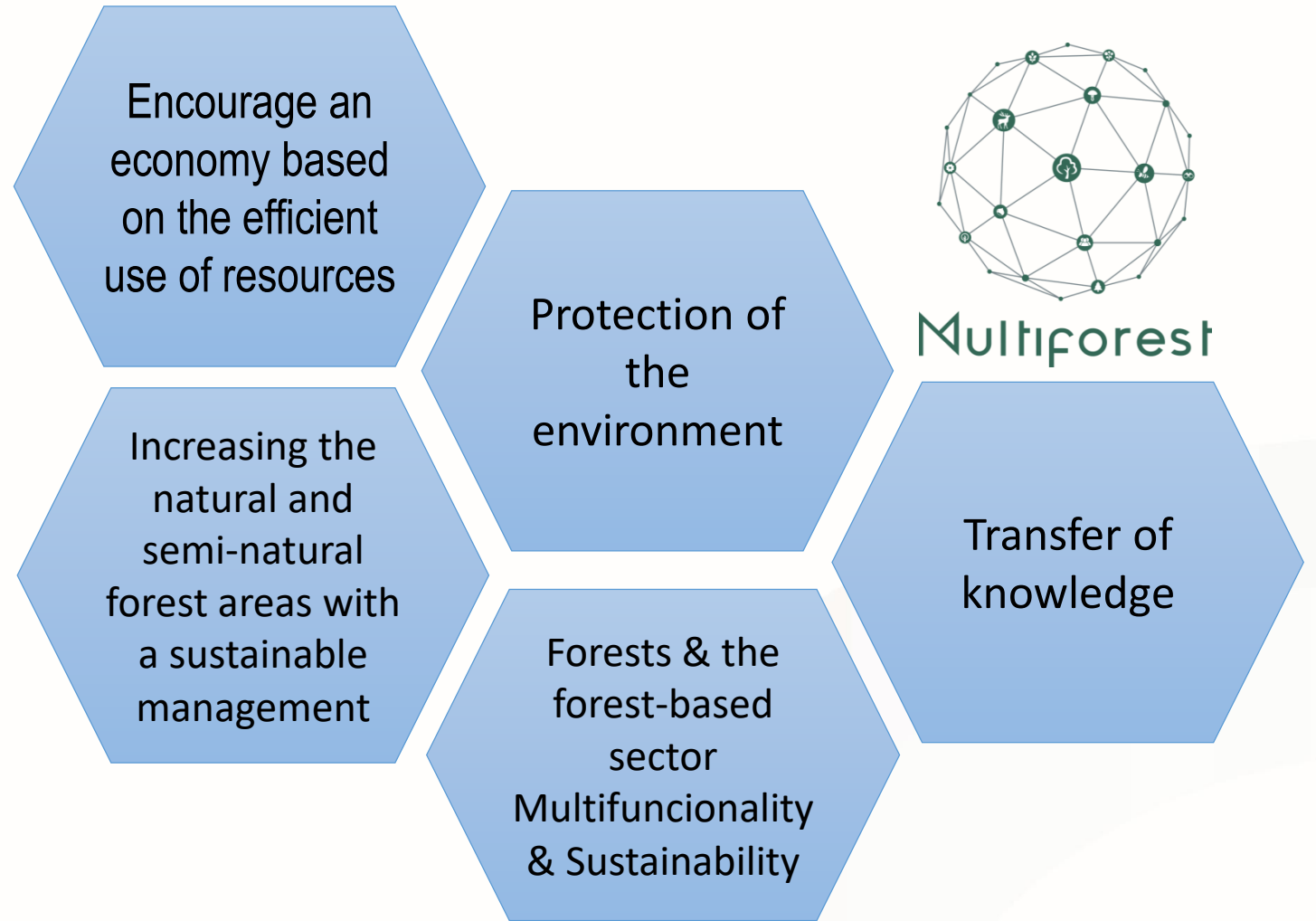


Assess the potential of forest ecosystems in Portugal in terms of (endogenous) natural resources and the provision of ecosystem services

Multifuncionalidade

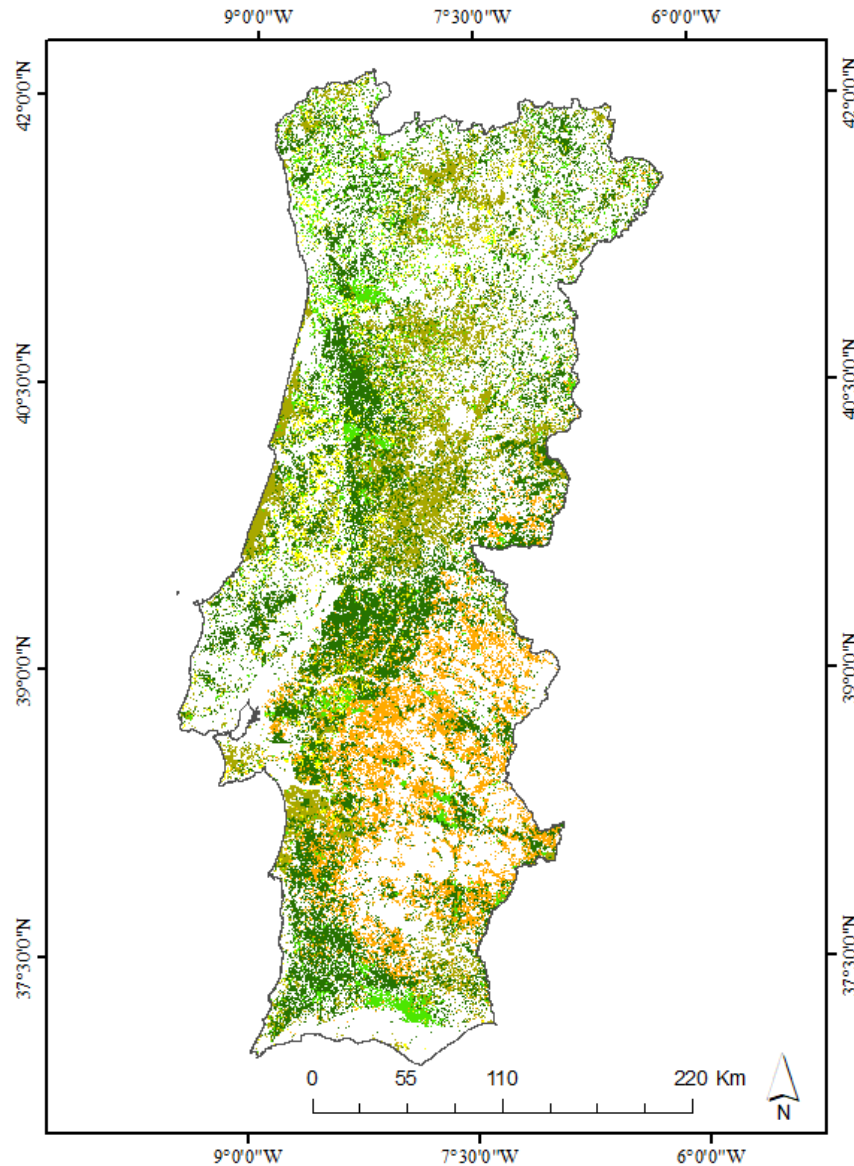
Best management practices

Sustainability





# Portuguese Forests with the MultiForest approach



- Legend**
- 3.1.1.02.1 Florestas de sobreiro com folhosas
  - 3.1.1.02.2 Florestas de azinheira com folhosas
  - 3.1.1.02.3 Florestas de outros carvalhos com folhosas
  - 3.1.1.02.4 Florestas de castanheiro com folhosas
  - 3.1.1.02.5 Florestas de eucalipto com folhosas
  - 3.1.1.02.6 Florestas de espécies invasoras com folhosas
  - 3.1.1.02.7 Florestas de outras folhosas com folhosas
  - 3.1.2.02.1 Florestas de pinheiro bravo com resinosas
  - 3.1.2.02.2 Florestas de pinheiro manso com resinosas
  - 3.1.2.02.3 Florestas de outras resinosas com resinosas
  - 3.1.3.01.1 Florestas de sobreiro com resinosas
  - 3.1.3.01.2 Florestas de azinheira com resinosas
  - 3.1.3.01.3 Florestas de outros carvalhos com resinosas
  - 3.1.3.01.4 Florestas de castanheiro com resinosas
  - 3.1.3.01.5 Florestas de eucalipto com resinosas
  - 3.1.3.01.6 Florestas de espécies invasoras com resinosas
  - 3.1.3.01.7 Florestas de outras folhosas com resinosas
  - 3.1.3.02.1 Florestas de pinheiro bravo com folhosas
  - 3.1.3.02.2 Florestas de pinheiro manso com folhosas
  - 3.1.3.02.3 Florestas de outras resinosas com folhosas
  - 4.1.1.1 SAF de sobreiro
  - 4.1.1.2 SAF de azinheira
  - 4.1.1.3 SAF de outros carvalhos
  - 4.1.1.4 SAF de pinheiro manso
  - 4.1.1.5 SAF de outras espécies
  - 4.1.1.6 SAF de sobreiro com azinheira
  - 4.1.1.7 SAF de outras misturas
  - 5.1.1.1 Florestas de sobreiro
  - 5.1.1.2 Florestas de azinheira
  - 5.1.1.3 Florestas de outros carvalhos
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  - 5.1.2.2 Florestas de pinheiro manso
  - 5.1.2.3 Florestas de outras resinosas

## Mixed forests

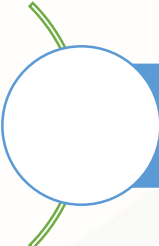
*MultiForest classification adapted from previous land cover maps*

COS 2018

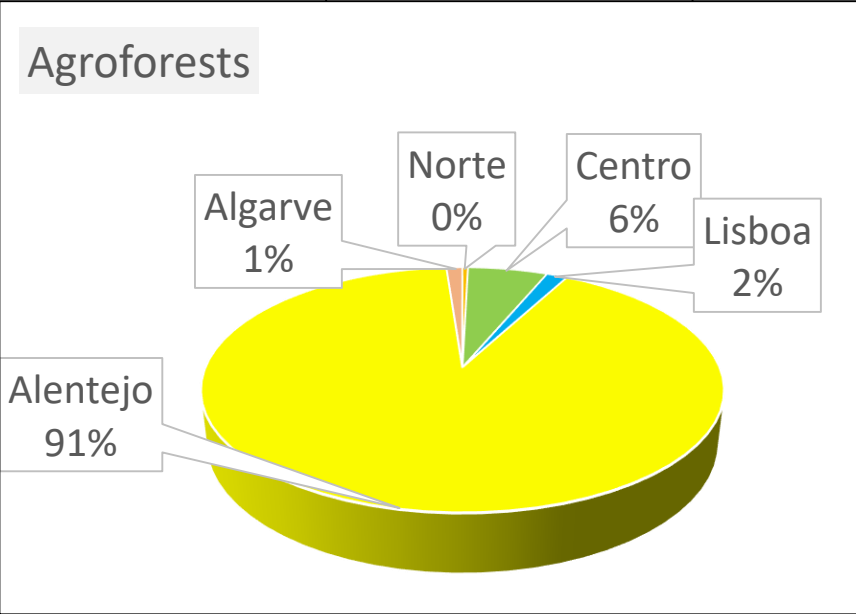
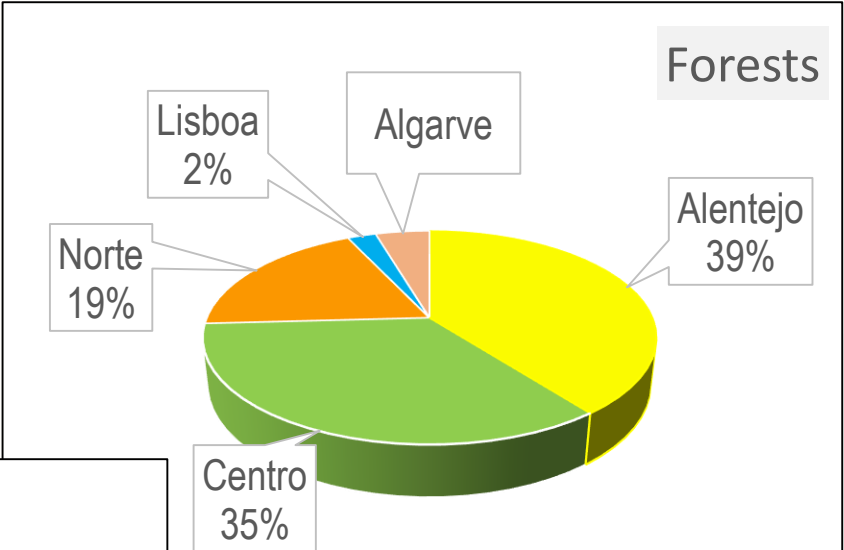
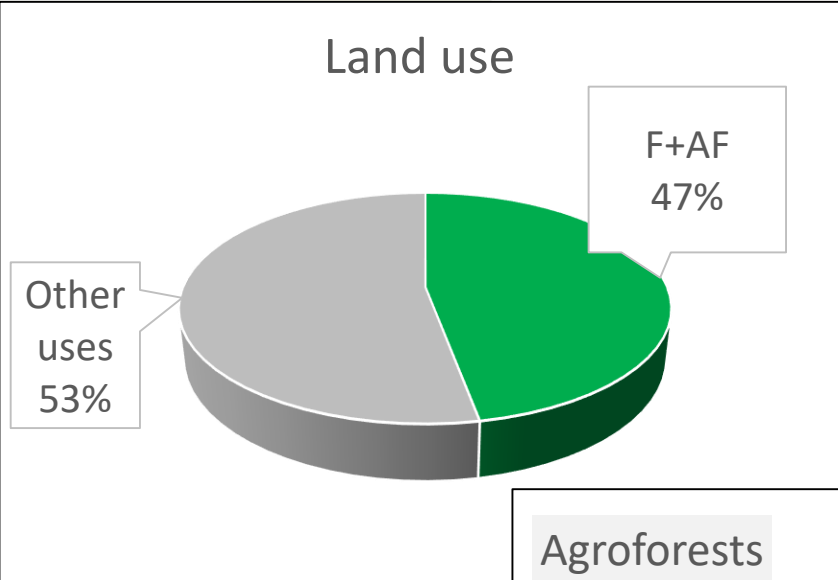
## Agroforestry systems

## Broadleaved forests

## Coniferous forests



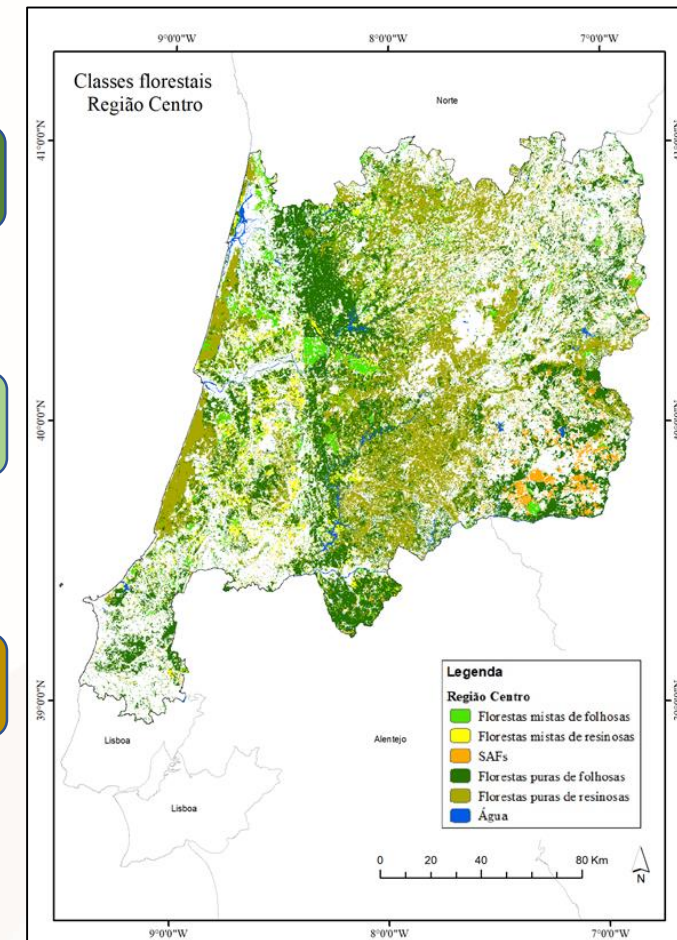
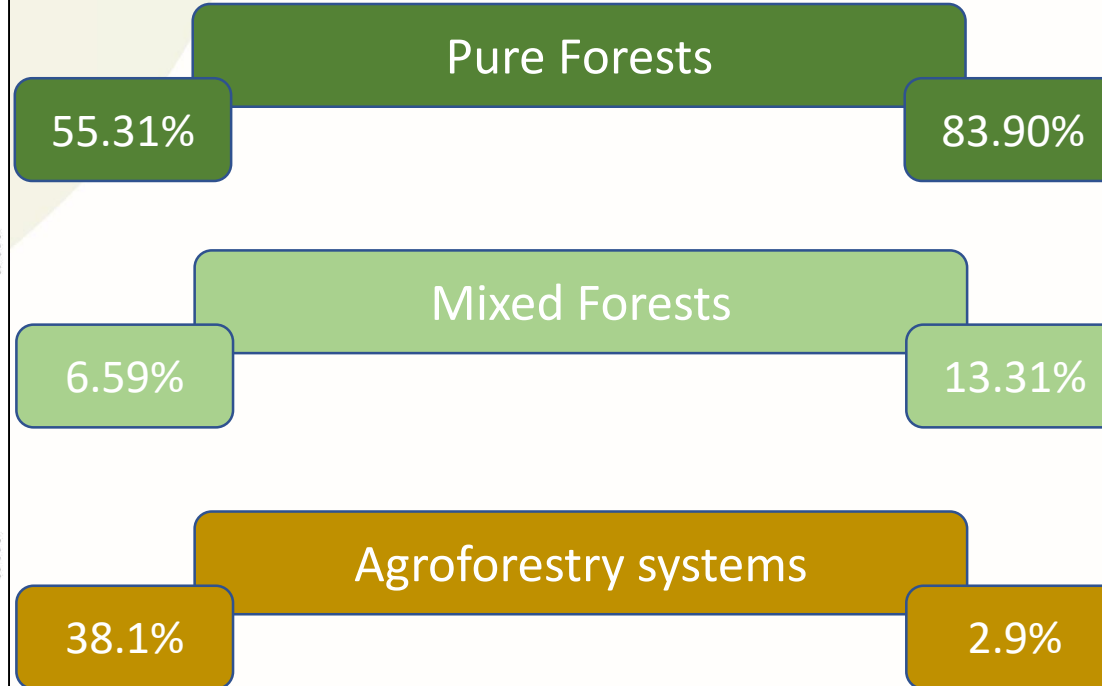
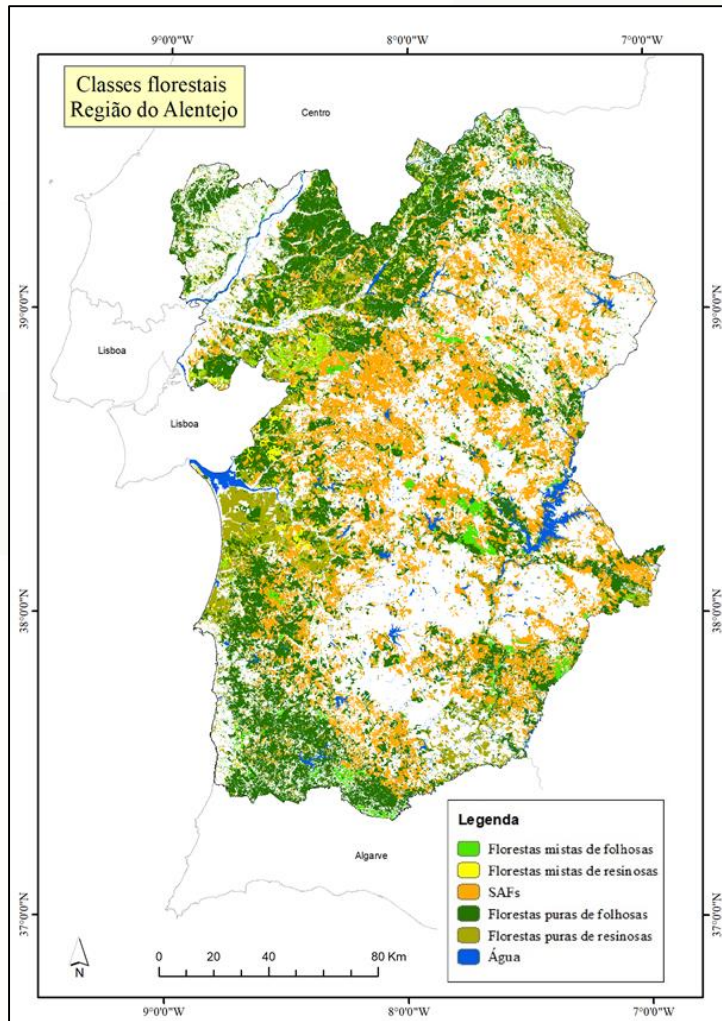
Regional mapping of forest areas, their potential and management practices



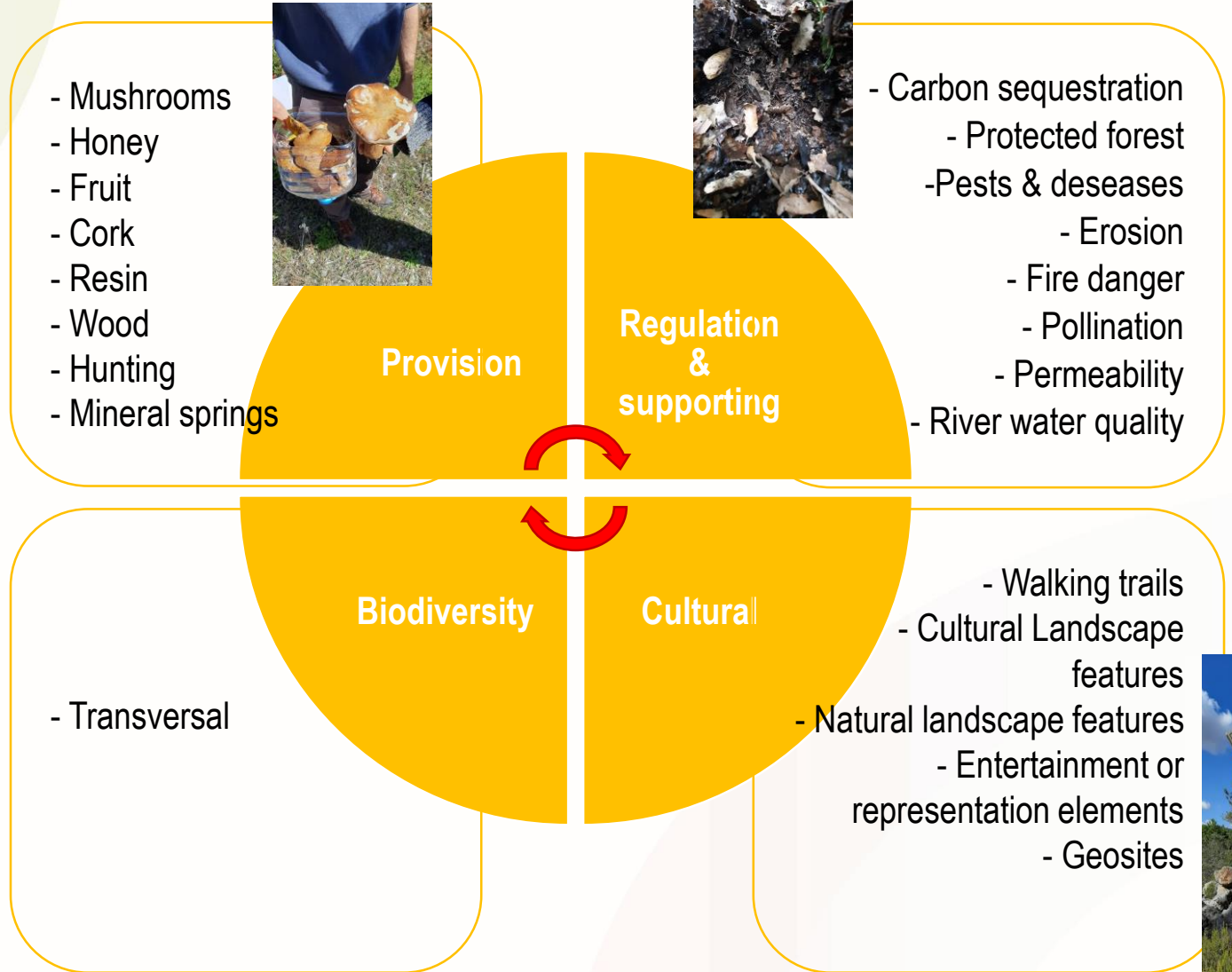
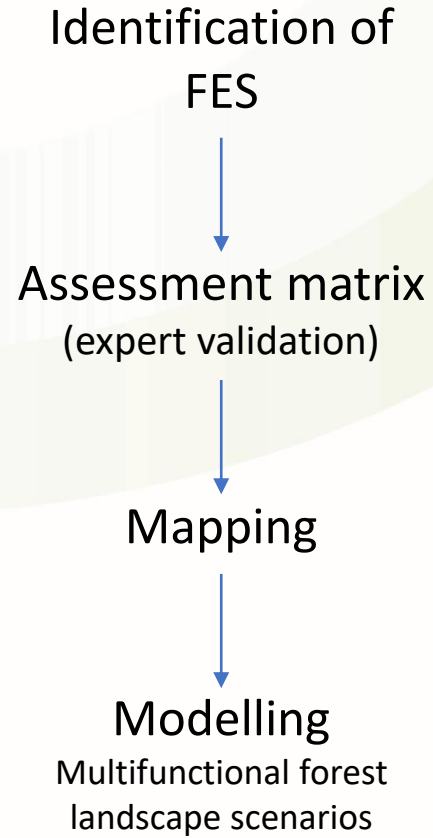


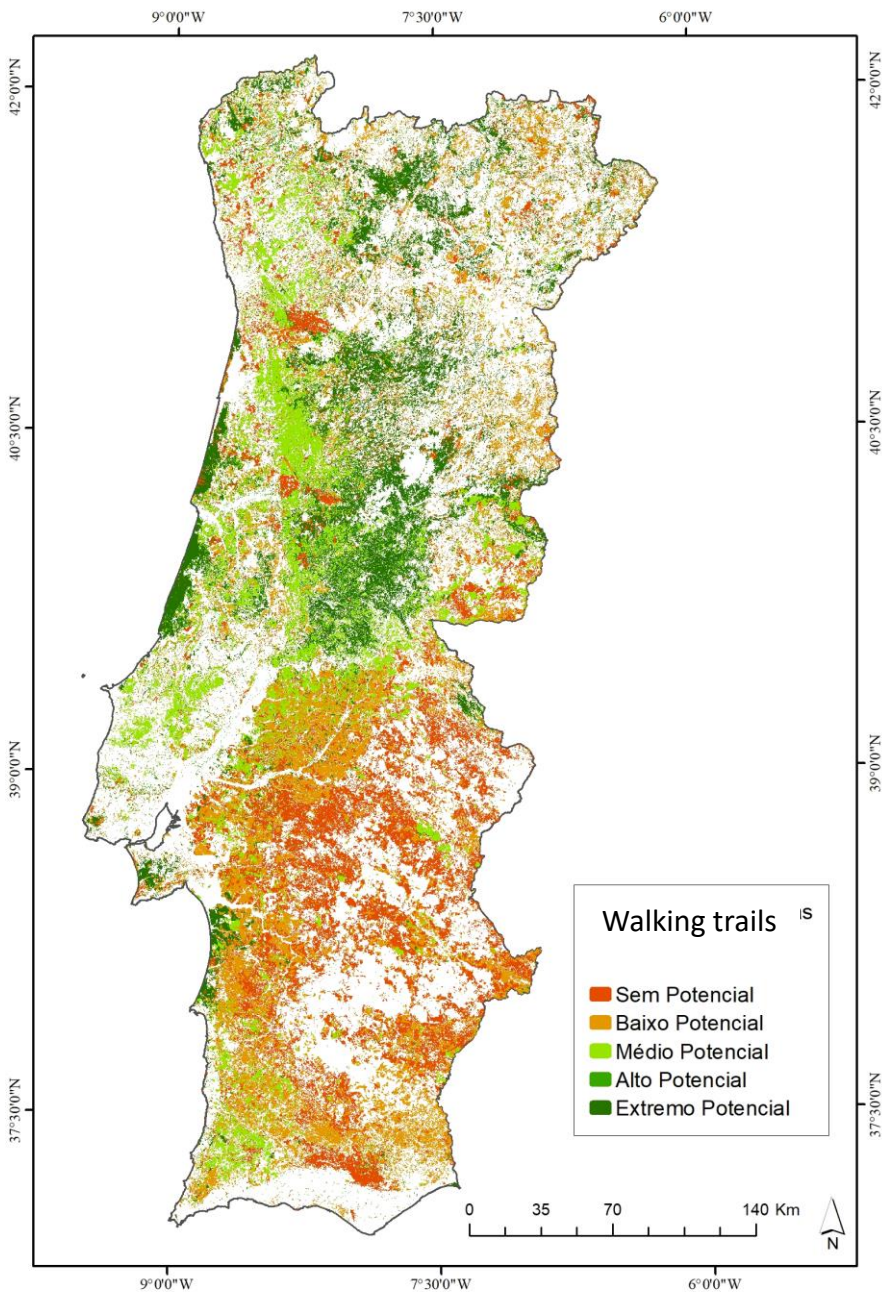
## Alentejo Region (53%)

## Central Region (51%)



# Most Relevant Forest ecosystem services (In the scope of this research project)





# Output (work in progress)

## Indicator: Walking trails

Pure broadleaved forests



Pure coniferous forests



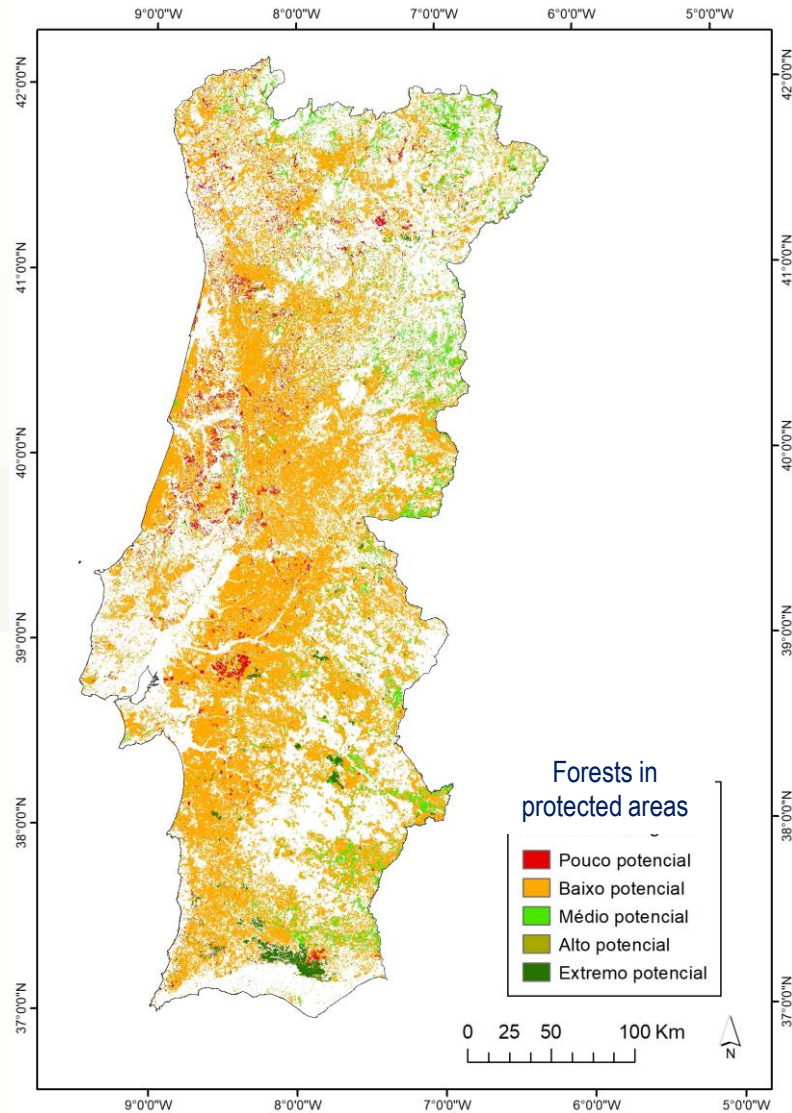
Agroforestry systems





# Output (work in progress)

Indicator: Forests in protected areas



Mixed broadleaved forests



Mixed coniferous forests



Agroforestry systems





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Thank you!