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Integrated Landscape Management for Forest Fire Resilience and Climate Change Adaptation

A model tailored for vulnerable areas with high fire risk in Portugal's Centro region

Integrated forest management approaches play a key role in climate adaptation by promoting collective management and common exploration of agroforestry spaces in smallholding and high fire risk areas. Measures include reducing inflammable vegetation, establishing protection zones, and increasing community engagement across areas larger than 100 hectares.

Key Learnings

- **Stakeholder engagement**: Forest owners and local residents play an active role in shaping the intervention plan, identifying feasible land use and occupation changes to enhance forest fire and climate resilience. Each community, in collaboration with key stakeholders, follows a participatory and tailored approach to ensure adaptation strategies are effectively aligned with local needs and conditions.
- **Land use change**: The participatory process informs the development of targeted actions and a customised forest management plan, including vegetation management. Such measures include replacing existing species with better fire-adapted alternative species and enhancing the sustainable use and value of existing forest areas.
- **New business models**: Some case studies show local communities and forest owners are open to adopting agroforestry species resilient to wildfires and climate change. However, to ensure economic benefits for those covering maintenance costs, there is a need for new sustainable business models.
- **Communication and training**: Training provides forest firefighters with best practices on managing inflammable vegetation and understanding natural processes, with a focus on on-site processing of residual forest biomass. It also fosters engagement with the local community, ensuring both safety and active participation in fire prevention efforts.

About the region

The Centro region has about 2.3 million inhabitants and is one of the five administrative regions in continental Portugal. Centro represents more than 30% of the Portuguese mainland, and forests cover almost 40% of its surface area, making it an invaluable asset. The region neighbours Lisbon and Porto – the two largest cities in Portugal – and Spain. The pilot actions in the Centro region focus on Médio Tejo and Coimbra. Médio Tejo spans across 3,344 km² and has over 230,000 inhabitants (INE, 2023). Coimbra covers an area of 4,336 km^2 with over 440,000 inhabitants (INE, 2023). Both regions face similar demographic challenges, such as low birth rates and a growing ageing population, as well as decreasing population in rural areas due to migration to urban centres and coastal areas. In addition, the territory is characterised by a small and fragmented land structure, which hinders the implementation of territorial policies.

Climate Hazards

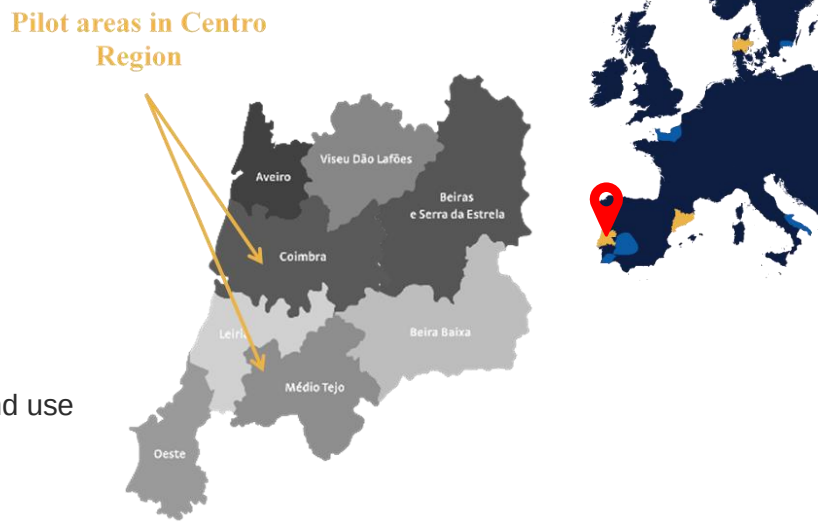
Hot Temperatures, Wildfires, Droughts, Water Scarcity

Sector

Agriculture, Forestry

Key system

Ecosystem and Nature Based Solutions, Land use and Food System



Climate Threats

The Centro region of Portugal faces increasing climate challenges and vulnerabilities, such as droughts, heatwaves and forest fires. These threats can lead to soil erosion, biodiversity loss, and decreasing investments in agroforestry systems by the private sector. Climate change is reducing air and water quality and is causing water shortages. Wildfires are a challenge in the region and exacerbate regional vulnerabilities, such as droughts. Finally, the abandonment of rural areas and traditional agricultural practices has resulted in growing forest areas with more inflammable vegetation and an increased forest fire risk in the region.

Integrated land management policies as a pathway to a more fire-resilient landscape

Forests cover nearly half of the Centro region. However, fragmented and predominantly private ownership (accounting for 91% of Portugal's forests (ICNF, Forest Profile, 2021), significantly higher than the EU average of around 60%) poses a challenge to sustainable forest management, limiting its potential to deliver social and economic benefits.

The Landscape Management Integrated Areas approach is a planning tool created by Portuguese regulation to support the management of forest territories that are often associated with small properties and have high exploitation costs and low profitability. The approach promotes common management practices and sustainable use of agriculture combined with forestry in areas with several small holdings

and a high fire risk, addressing the need for planning and landscape management. The integrated policy approach means balancing environmental challenges, economic growth, and social well-being alongside achieving widespread fire resilience.

The State, local authorities, forestry or agricultural producer organisations, cooperatives, local associations, non-governmental environmental organisations, wasteland management entities and collective investment organisations can constitute Landscape Management Integrated Areas. Although various actors can start the process, the implementation underlies a formal procedure, which requires submitting a proposal to the national Directorate-General for Territory, to allow a quality assessment of the proposal and verify compliance with all applicable legal requirements.

The approach focuses on micro-territorial contexts suitable for active forest management, assigning responsibility to a management entity formed by landowners – or a delegated body – to oversee maintenance and management actions such as reducing inflammable vegetation, replacing inappropriate species, and improving existing forest stands to promote safer and more resilient landscapes in areas larger than 100 hectares. As it is organised around specific local communities, the success of Landscape Management Integrated Areas depends on the dedication of producers and landowners. Thus, involving local stakeholders, such as municipalities, especially in depopulated and ageing rural populations, is very important.

Among other actions, the Landscape Management Integrated Areas approach foresees the reduction of the existing fuel load (vegetation management), the replacement of species (favouring more fire-resistant vegetation such as arbutus), the improvement of existing forest stands, as well as the collaboration with the local community to promote safety and active participation.

“Effectively tackling forest fires in a territory requires an integrated approach that recognises the interlinked relationships between land management, property fragmentation, rural abandonment, natural capital and the rural economy. Only by recognising the systemic character of this challenge, we can ensure a long-term climate change adaptation vision for the territory.”

Sophie Patrício, Head of Regional Promotion, Innovation and Competitiveness Division, at CCDRC, I.P. (Regional Development and Coordination Commission of Centro region of Portugal)

Figure 1: Collaborative workshop in the Municipality of Lousã (October 2024) on future interventions in the Village Condominiums and Landscape Management Integrated Areas of Coimbra region. Image Credit: Coimbra region.

Figure 2: Interventions in the Village Condominiums and Landscape Management Integrated Areas of Coimbra region to reduce fuel load. Image Credit: Coimbra region.

Summary

In Portugal's Centro region, fragmented and predominantly privately owned forest areas pose significant challenges in addressing the severe risk of forest fires – one of the region's most pressing climate risks. Landscape Management Integrated Areas provide a structured response to planning and landscape management, expanding the scale of managed forests. This approach enhances forest fire resilience, strengthens natural capital, and supports rural economies. Key elements include stakeholder engagement, sustainable land use change, innovative business models, targeted communication and training initiatives.

Further information

The work presented in this adaptation story is part of the RESIST Mission project.

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- Further information about the Landscape Management Integrated Areas approach can be found here: https://www.dgterritorio.gov.pt/paisagem/ptp/aigp.
- More information about the Centro region's involvement in the Horizon Europe-funded RESIST project can be found here: https://resist-project.eu/regions/centralportugal/.

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