NEW EU STRATEGY ON ADAPTATION TO CLIMATE CHANGE
CHALLENGES AND RECOMMENDATIONS FROM LIFE REDBOSQUES PROJECT AND EXPERIENCE ON ADAPTATION OF FUNGOBE/EUROPARC-SPAIN

Maintaining healthy ecosystems is crucial to ensure the provision ecosystem services (provisioning, regulating and cultural services) to society. The relationship between the maintenance of biodiversity and the effects of global change, including climate change is clear. But also other global processes - like pandemics that put the entire social and economic system in crisis - highlights the multiple connections among complex phenomena, which need to be tackled quickly and with a broad scope. In this sense, the interconnection between European policies aimed at environmental, social and economic sustainability in the short, medium and long term is more necessary than ever.

From the experience gained from LIFE RedBosques[1], and other projects related to adaptation to climate change[2], we suggest the European strategy for adaptation to climate change to include among its lines of action the following axes: 1) Conserve ecosystems in good condition, and therefore maintain Biodiversity, 2) Managing ecosystems for adaptation, restoring those that have been deteriorated, and 3) Improving governance systems towards the co-responsibility of institutions and individuals in adaptation to climate change.

The importance of forest conservation

- Some of the main driving forces (ancestral human use, recent abandonment, new biodiversity conservation objectives, different administrations with different competences and aims, or the role of private ownership) are common to many European forests - especially in the Mediterranean Region. In the EU most of the forested territory is covered by young or rejuvenated forests, generally very simple and homogeneous both in species and structure. These make them especially vulnerable to disturbances such as fire or insect outbreaks, even more considering future climate scenarios, with increased temperatures and more intense droughts.

- Well-preserved forests represent an opportunity in the development of "natural solutions" to face climate change effects. Forests are fundamental elements in mitigating climate change, since they are the main carbon sink in the terrestrial environment. Their protection must be a priority in any adaptation strategy. However, their role is not limited to being carbon sinks: they provide a multitude of other services to society. In developing mitigation and adaptation strategies it is key not underestimate of the importance of maintaining biodiversity and the proper functioning of ecosystems.

- Old-growth forests - those in advanced stages of their life cycle and with little or no human intervention - are extremely scarce and valuable. Their protection should be a priority in an adaptation strategy, since they play an important role in mitigating climate change by helping to remove carbon from the atmosphere and storing it in the very long term.

- From the point of view of adaptation to climate change, the structural complexity and the diversity of tree species are characteristics of old-growth forests that give them greater resilience. For this

[1] EUROPARC-Spain. 2020. Mediterranean Old-growth Forests. Characteristics and Manegement Criteria in Protected Areas. Fundación Fernando González Bernáldez. Madrid. (English draft available).
[2] EUROPARC-Spain. 2020. Protected Areas in the Face of Global Change. Climate Change Adaptation in Planning and Management.. Fundación Fernando González Bernáldez. Madrid.

reason, they can serve as references for a forestry aimed at fostering the attributes of maturity that confer a greater capacity for adaptation.

Managing ecosystems (and restoring where necessary) to improve adaptation to climate change

- Manage ecosystems to minimize stress factors other than climate change, and promote mechanisms for resilience (heterogeneity, diversity, facilitation, etc.) as a way of adaptation to climate change.

- An adaptation strategy should promote a forest management focused towards - in addition to the economic benefit where it is feasible - the improvement of adaptive capacity and the restoration of ecological integrity.
  Forests, although sometimes not providing direct economic returns, are essential in the provision of regulatory services (hydrological cycle, flood control, erosion control). These functions are increasingly relevant due to the increased frequency and intensity of extreme events (droughts, floods, torrential rains).

- Forest management with adaptation objectives should focus first on the extensive areas of young or simplified forests, since these are particularly sensitive to disturbances such as wildfires or insect outbreaks, which will become more frequent and intense in the future. The aim should be to promote resilience by maintaining or improving species diversity and spatial heterogeneity.

- Large and continuous areas of young, homogeneous and mono-specific forests, in which often management has been abandoned, are particularly vulnerable to climate change and especially to large fires. However, a regime of small frequent and low intensity fires plays a relevant role as creator of heterogeneity and diversity, and paradoxically reduces the risk of a large fire and improves resilience. Measures that promote landscape composed of a heterogeneous mosaic that hinder the advance of fire should be promoted, with patches of different degrees of maturity, and restricting the total elimination of biomass ("fuel") to areas of strategic value in a regional scale planning.

- It is essential also to consider the landscape mosaic, maintaining or restoring the components that allow ecological connectivity and the flow of species and processes at a regional scale, which will be vital to allow adaptation processes.

- Both in forests with conservation or productive objectives, or in young forests or those rejuvenated by management or by wildfires, forestry may promote the restoration of processes and elements linked to mature stages of the forest cycle (i.e. spatial heterogeneity, tree species diversity…). This increases resilience to extreme events and provides better adaptation to climate change.

- Mitigation and adaptation actions must be carefully assessed in order not to conflict with biodiversity values and the preservation of the full array of services forests provide. Forests cannot be seen only as biomass producers or carbon sinks. Carbon neutrality of bioenergy is under high debate in the academic arena, and mitigation projects based on forest biomass might be developed in a case by case basis.

Adapt governance systems

- If it is to be effective, climate change adaptation will need to improve and diversify governance systems, encouraging greater social involvement and a broader spectrum of stakeholders. This will be key to allow stakeholders embrace the adaptation measures as their own, and participating in the design and implementation of adaptation measures, and in monitoring their effectiveness.
  There is a need to support efforts on the ground in awareness raising, communication and training on climate change adaptation, as well as in new management and decision-making mechanisms that promote greater participation and social co-responsibility. .

- In the case of forest management, the participation of all the stakeholders is required, allowing them to embrace the need to improve the conservation status of natural ecosystems as a way to tackle climate change. To achieve this, a change of mentality will be needed at all levels (from decision makers to managers and field workers) in order to incorporate new objectives into ecosystem management. For this, it will be necessary to build new capacities and improve training of all the actors involved.

- From the point of view of coordinating different policies, the inclusion of adaptation measures in the allocation of CAP funds is especially relevant. In order for these funds to achieve the objective of improving climate change adaptation effectively, it is necessary to define more precisely what is meant by adaptation actions, which are considered good practices - and put them in value - and avoid financing "maladaptation" practices.

- Since CAP fund managers and those responsible for conservation (and therefore adaptation) actions are not the same, it is necessary for fund managers to appreciate the importance of dedicating a substantial part of the funds to conservation (and thus adaptation), and to facilitate conservation managers have access to those funds to implement conservation policies more effectively.

- In order to reduce uncertainty and provide scientific evidence to decision making, more support will be needed to research and monitoring, not only to increase knowledge on future climate scenarios and species' and ecosystems' adaptability, but also to consider the social, cultural and economic dimension of climate change and adaptation options.

These recommendations are based on the results of the LIFE RedBosques project (LIFE15 GIE/ES/000809). More information in: www.redbosques.eu

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