

THE ADAPTATION OF FORESTS TO CLIMATE CHANGE AND THE ROLE OF LOCAL AUTHORITIES

St. Celoni – 16/05/2018

Forests and adaptation to climate change – Jordi Vayreda (CREAF)

1- The role of land systems in the carbon cycle

Forests store almost 900 billion tons of carbon (C), 60% of which is stored in the ground or dead wood, the other 40% in the aerial and underground part of trees. As for C flows, although as a result of photosynthesis forests capture 120 billion tons of C per year, the final balance - as a result of emissions from the respiration of forests and decomposing organisms and disturbances (fires, wood and firewood use, etc.) - is only 1 billion tons. This net abduction of C from the atmosphere has been maintained and even increased in recent decades so that forests worldwide are responsible for capturing 30% of the CO₂ emitted annually as a result of human activities: burning fossil fuels and changing land uses. In Catalonia, forests also sequester more C than they do not emit, making the net balance of 1.3 million tonnes of C captured annually, despite this they only sequester 10% of the total emissions of greenhouse gases from Catalans. , in other words it would take 10 times the forest area we currently have to offset all our emissions..

2- Impact of Climate Change on forests, mitigation tools and future forecasts

As a result of the continued rise in CO₂ in the atmosphere (the psychological barrier of 400 ppm was exceeded in 2015) the global temperature of the planet has continued rising and climatic phenomena are becoming more extreme and frequent. These changes are leading to a weakening of the forests with an

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increase in mortality episodes and a reduction in growth. At the moment it affects species located in areas of alpine or Atlantic climate and to a lesser extent in Mediterranean forests such as holm oak groves or Aleppo pine forests. Several studies suggest that forest management, by reducing competition for resources such as water, can help mitigate the effects of climate change, at least in the short term. Other studies suggest that increasing the richness with management favoring mixed forests can serve to reduce their vulnerability, while increasing their productivity and adaptability.

Climate change projections suggest that by the end of the 21st century, the increase in annual temperature could be between 3 and 4 ° C and the reduction in precipitation in summer of up to 50%. Simulation models, taking into account these projections, predict a reduction in climate suitability for most wooded species in our country, with the exception of the more Mediterranean species that would increase their geographical distribution area. Forestry simulation models predict a general reduction of the sink capacity and for many species, and even in the medium term (decades) they will no longer have this capacity and will be net emitters of CO₂.

Forest management is urgent to adapt our forests to climate change to make them less vulnerable if we want to continue enjoying the invaluable services they offer us.

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