

Copa - Cogeca climate change series

INFO SHEET

Forests and climate change



The negotiations towards a new agreement on climate change, within the framework of UNFCCC, put forests at the heart of the climate change agenda.

Whilst forest loss, primarily tropical deforestation and forests degradation, accounts for approximately 17 per cent of global greenhouse gas emissions, sustainably managed forests play an important role in climate change mitigation.



The carbon stored in EU forests and in wood products is the most important carbon sink. At the same time, wood-based products act as a substitute for products made with non-renewable resources.

In the long run, climate change can affect forest ecosystems and the preconditions for practising forestry and the whole forest sector in Europe. Thus, it is important to understand the climate change impacts on forests in order to be able to develop necessary adaptation strategies and to make most of the mitigation potential.



The long time spans involved in forestry mean that adapting to climate change has to begin as soon as possible.

First and foremost, forestry should be considered as the sector that offers the greatest potential in mitigating climate change.





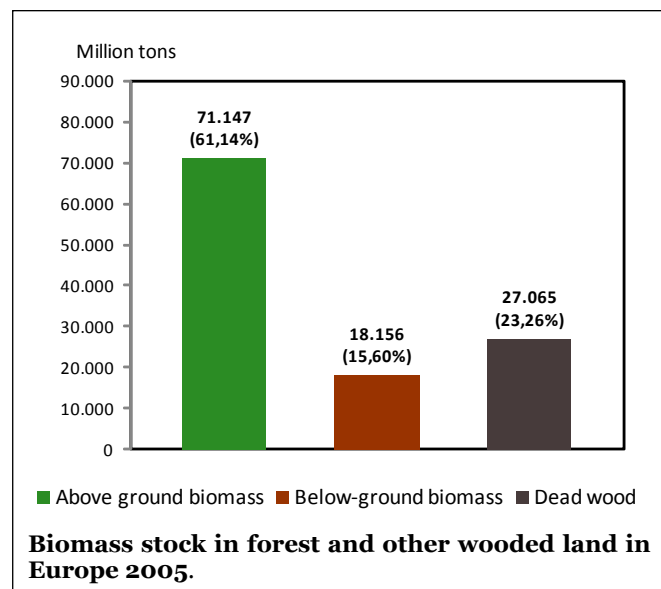
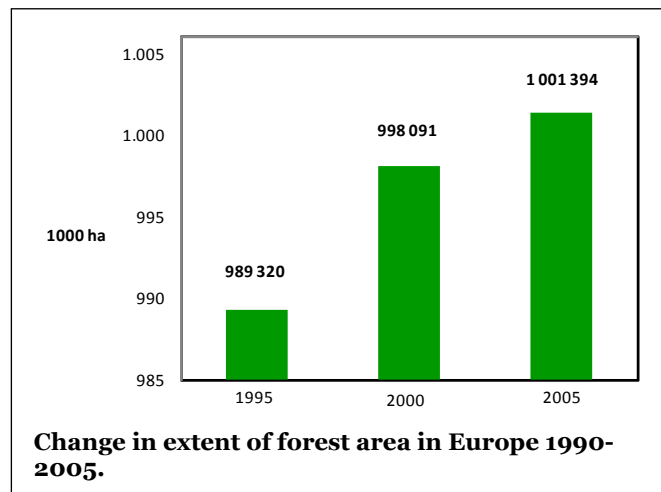
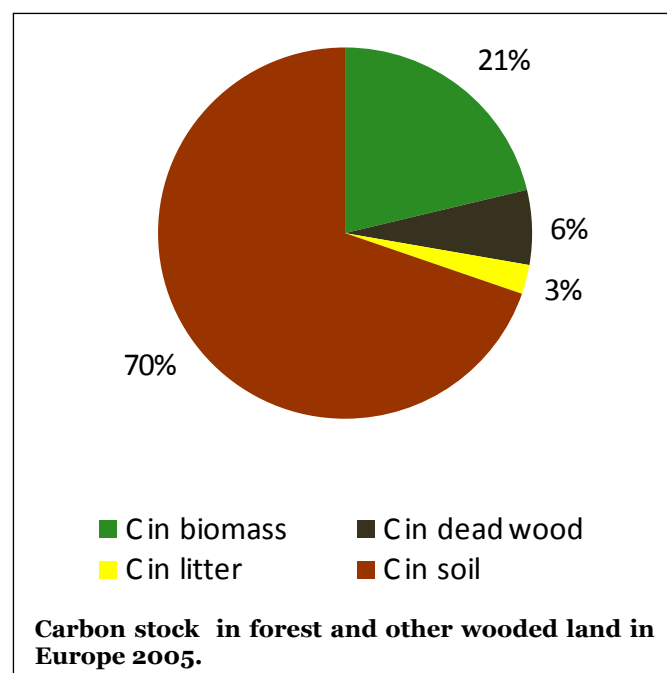
Specificities of forests and their prominence for contributing to climate change¹

There are 156 million hectares of forest land in the EU-27. During the past 15 years the forest area has grown by about 10 million hectares as a result of afforestation, reforestation of former agricultural land and natural reforestation.

The forest stock of EU-27 has also been growing constantly over the past 50 years. The total volume of standing timber is around 23 billion m³, which is equivalent to 9.1 giga tons of carbon. Commercial forest growth exceeds felling by a considerable margin in Europe (forest utilization rate is about 60%). Because their growth exceeds felling, European forests have been functioning as a carbon sinks, thus helping to slow the build-up of carbon dioxide in the atmosphere.

The European Union's forests present a wide variety of ecological and socio-economic conditions. Forests are recognised as one of Europe's most important renewable resources providing multiple benefits to the society and the economy. Additionally European forests, ranging from the Mediterranean to the Boreal, from the Atlantic to the Alpine zones, represent in their enormous biotic differences the main depository of biological diversity.

About 60% of forests in the EU-27 are privately owned, mainly by families, and 40% are publicly owned, e.g. by the state, municipalities, religious communities and other entities.



Forests – the key to adapting to climate change

Climate change affects vegetation zones differently. Longer, dry, hot periods increase the risk of forest fires in the Mediterranean zone. Longer growing seasons mean that the probability of climatic extremes such as storm damages in central and northern Europe is greater.

Due to climate change, forests are facing the challenge to adapt to changes and dynamics of average temperature as well as to extreme temperatures, change of water availability and rainfall pattern, increase weather extremes as well as soil acidification, loss of nutrients and the impact of increased ozone.

Good forest management is the main way of improving forests' ability to adapt to climate change. EU forests are for the most part managed on an ongoing basis and are thus able to sustain high production levels and retain their vitality. The long time horizons in forestry, with rotation periods of between 15 and 150 years, mean that any adaptation measures should begin as

¹ State of Europe's Forests 2007. The MCPFE Report on sustainable forest management in Europe. MCPFE, UNECE and FAO, Warsaw 2007, 247p.



soon as possible. Supporting further research is of paramount importance in order to create forest policies and further develop sustainable forest management practices suitable to adapt to the new situation. Key areas for research include²:

- Broadening the understanding of mycorrhiza treatment on seedling roots and fertilisation techniques, to improve the establishment and growth of forests.
- Investigate mechanisms by which species can adapt with particular focus on potential use of currently non-commercially used tree species outside of their natural growing area.
- Study harmful invasive species preparing prognosis on the possible threats, spreads and effects on forests aiming at finding prevention and protection mechanisms against them.
- Investigate carbon sequestration in forests with a view to optimising its management.

Awareness of the impacts of climate change as well as of the importance of forest management in adaptation must be increased accordingly among forest owners, the public and decision makers.

In forest regeneration preference should be given to native tree species whilst at the same time attempting to study and introduce new species which have the ability to adapt and benefit from changing climate conditions. In addition, mixed forests could be recommended where this is possible to have higher resistance to storm and insect damage. Research on alternative resistant tree varieties and the introduction of new or novel species to new areas should be supported among predictive modeling of damages caused by extreme and sudden weather changes.

Climate change is expected to increase further the number of natural catastrophes. In the case of forests this means more forest fires, storm damage and widespread insect damage increasing the need for forest management practices to adjust. Between 2000 and 2006 reports³ of forest fires in France, Greece, Italy, Portugal and Spain show that forest fires are the most important threat to forest and wooded areas. In these areas more than 450 000 ha burned on average each year. In 2007 the phenomenon became even worse, especially in the south-eastern countries and the total area burned was about 500 000 ha. Therefore, at this point in time, particular attention should be paid to restocking methods, including selection and combining use of tree species, fire prevention and

insect control. For these measures the EU should ensure that adequate financial support is available.

The mitigation potential within forests

The forest sector can reduce the amount of carbon dioxide in atmosphere and thus help to mitigate the climate change:

- by increasing carbon stocks in forests and wood-based products
- by producing wood-based products that can be used to replace products which are more harmful from the viewpoint of climate change
- by protecting forests from deforestation and preventing the release of carbon stored in trees and in the forest soil into the atmosphere
- by increasing new forests on abandoned or marginal agricultural lands through a sustainable afforestation and reforestation.

Sustainable forest management with regular harvesting improves carbon mitigation as forests are constantly developing new and additional carbon sequestration capacity. Premature trees that dominate managed forests have a very high capacity to store carbon due to their exponential growth and thus allow larger amounts of timber to be harvested. The larger the carbon store is in the forest products, the more positive the effect of forestry on climate change. Taking also into account the benefits for forest vitality, stability and health, forests must be managed on a continuous basis. The Ministerial Conference on the Protection of Forests in Europe (MCFPE) has established criteria and indicators for sustainable forestry. The EU should support this process as a key reference point for the sustainable use of forest resources within the framework of sustainable development, nevertheless respecting the subsidiarity principle. Continuous, sustainable management and use of European forests has an important role in preventing the delocalization of timber production to third countries. Moreover, the cost of allowances under the ETS⁴ will have detrimental effects on cooperatives engaged in pulp and paper processing and other forest-based industries with the risk of carbon leakage.

To improve the carbon sink function through land use change, the forest area could be expanded especially to abandoned land areas. Afforestating unused areas would prevent erosion and thus the loss of sequestered carbon in the soil. Additionally, the increased land area available would be beneficial for sustainable biomass production.

Wood is a renewable natural resource and promoting its use in society as a building material and a source of energy is the

² "Towards a Strategy on Climate Change, Ecosystem services and Biodiversity", A discussion paper prepared by the EU Ad Hoc Expert Working Group on Biodiversity and Climate Change. Vilim 2009.

³ European Parliament study on Forest Fires: Causes and contributing factors in Europe. 56 p. IP/A/ENVI/ST/2007-15

⁴ ETS. Directive 2009/29/EC. Official Journal of the European Union L 140/63.



most effective way of locking up carbon dioxide in trees and wood-based products, which function both as carbon sinks and a substitute for materials based on non-renewable resources. Possibly in the future green house gas (GH) emissions will also be reduced by replacing fossil fuels with renewable forest based biofuels.

Inventive use of wood can bring about additional mitigation potential. Burying forest biomass (for example treetops) in form of charcoal or “Biochar⁵” into the ground can boost soil fertility and transfer a sizeable amount of CO₂ from the atmosphere into safe centuries-long storage in topsoil, thus optimizing the carbon cycle. If recognised as a form of mitigation technology under the Kyoto Clean Development Mechanisms, biochar could be also be used for CER credits.

With the help of forests, Europe can effectively remove atmospheric carbon. This would require increased afforestation and felling, longer timber products life cycle, replacing fossil fuels with timber and possibly, timber bring permanently stored to exclude carbon from the natural circulation.

Challenges ahead

The Kyoto Protocol recognised the fact that forests should be included in a global strategy to fight climate change. However, its provision for forest related measures are rather limited, especially for European forestry. Furthermore the negotiations regarding the post-Kyoto period from 2012 onwards have focused on reducing deforestation and forest degradation (REDD⁶) as leading causes for global warming. Such an approach might lead into a one-sided focus on increased carbon storage in forests, neglecting the use of timber and forgetting the positive effects forests and harvested wood products have on climate change mitigation. Therefore, it is of paramount importance that the role of forests and harvested wood products is further recognised as carbon sink potential in climate change mitigation in the forthcoming climate treaty negotiations in Copenhagen in December 2009.

Furthermore, due to the current uncertainties related to forest carbon stock permanence and carbon accounting mechanisms, a possible framework for forest carbon trading needs to be recognised for both forests and harvested wood products, to safeguard productive functions of forest and to create incentives for using wood-based products.

National strategies which support sustainable forest management are required for better utilization of forests’ and wood based products’ mitigation and adaptation potential. These strategies need to be created with widespread

participation from different stakeholders and sectors.

The RED⁷ Directive, approved in the European Union’s climate and energy package in December 2008 set Member States the target of achieving a 20% renewable energy share by 2020 by making greater use of existing wood sources. Achieving these renewable energy targets in forest-based bioenergy has an important role by substituting harmful fossil fuels. However, more forest-based biomass need to be mobilized, both in the short- and long-term. Additionally supporting measures are needed to enhance the development of functioning markets for bioenergy as it is a prerequisite for the increased use of bioenergy.

The increased use of forest-based bioenergy and wood as a raw material are quick cost-efficient mitigation measures. Therefore, Member States have to put in place a favourable set of policies to support the use of wood in different forms. Also in the future, the increased use of forest resources has to be based on the well-defined and well-implemented principle of sustainable forest management.

It is essential to put in place policies in Member States that favour the use of forest-based materials whilst bearing in mind forest owners’ rights to manage their forests in a flexible way.

⁷ Framework Directive for Renewable Energy (RED)

⁵ Environmental Health Perspectives, Vol. 117, N:o 2, 2009. Innovations. Biochar: Carbon Mitigation from the Ground Up

⁶ REDD= Reduction Emissions from Deforestation and Forest Degradation

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