WHY IS NATURE RESTORATION CRITICAL FOR CLIMATE ADAPTATION IN THE EU?

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Climate change is exacerbating the occurrence and strength of natural disasters, the effects of which are increasingly being felt in the EU and globally. Climate-related extremes such as floods, droughts, forest fires, temperature extremes, and landslides post serious risks to human health and can cause major economic losses.

While average annual losses from climate-related extremes in the EU were already estimated at €14.5 billion annually between 2011 and 2020, they are becoming even more frequent and expensive [1]. The 2021 summer floods in Germany, France, Netherlands, Belgium, and Luxembourg caused €46 billion in damages, and took the lives of 240 people [2].

Nature restoration is critical for reducing climate change-related risks by reducing human exposure to climate related hazards and the vulnerability of ecosystems and biodiversity to the impacts of these hazards. In addition, it helps build capacity to adapt to these impacts and can in some cases reduce the frequency and intensity of climate-related risks [3].

Nature restoration measures to reduce climate related risks can often be more cost-effective in the long-term than grey solutions based on concrete and metal [4], particularly considering the delivery of wider co-benefits. Moreover, restoration has the potential to reduce the severity and frequency of key climate related risks.

NATURE RESTORATION IS CRUCIAL TO REDUCE THE INTENSITY AND FREQUENCY OF FLOODS IN THE EU

Wetlands and freshwater ecosystems

Restoring wetlands and freshwater ecosystems reduces flood risk by increasing the ability of nature to act as a sponge **- increasing water absorption and storage.** In Europe, enhancing floodwater retention areas of rivers can decrease flood exposure by up to 70% [4].

The Dutch 'room for rivers' programme

The Dutch 'room for rivers' programme reduced flood frequency and exposure, with benefits valued at around €2 billion of avoided economic damage in case of breaching and around €70,000 a year from reduced flood frequency [5].

Bonn, Germany, Photo by Matthew Jarvis

Forests

Restoring forests can reduce flood risk by increasing the ecosystem's capacity to **absorb and retain water in its vegetation and soil** [6]. This can also reduce the risk of other hazards like landslides.

Urban areas

Urban restoration reduces flood risk of urban areas as green and water elements are **permeable surfaces** which provide an additional capacity to cope during rainfall events [7, 8].

Agricultural areas

Agricultural restoration can contribute to reducing flood risk to agriculture and downstream areas by **reducing surface runoff and increasing groundwater infiltration** [9].

NATURE RESTORATION HAS THE POTENTIAL TO REDUCE FOREST FIRE RISK

Restoration measures and other nature-based solutions can prevent and reduce fire risk through fire-smart management plans, policies, and practices. Passive and active restoration measures help re-establish **forest diversity and fire resilience**.

NATURE RESTORATION INCREASES CITY RESILIENCE TO EXTREME HEAT AND REGULATE MICRO-CLIMATES

Urban green spaces and vegetation help reduce temperatures and the urban heat island effect. The cooling effect of trees through shading and transpiration can **cool the land surface temperature** of cities in Europe by up to 12°C [10].

NATURE RESTORATION INCREASES ECOSYSTEMS' RESILIENCE AGAINST DROUGHTS

Restored water ecosystems will have a better storing capacity in periods of heavy rainfall, thus avoiding flooding and **delivering fresh water in periods of drought**. For example, the restoration of wetlands as a managed aquifer recharge can enhance the drought resilience of agricultural land and therefore safeguard agricultural production [11].

NATURE RESTORATION REDUCES THE RISK OF TERRESTRIAL AND COASTAL EROSION

Coastal sand dunes provide natural barriers against marine flooding, storms, and erosion.

LIFE Endure against coastal erosion

The LIFE Endure project tested nature-based methods to improve dune resilience to climate change impacts on 110km of coastline and 3,300 hectares of dunes in the UK, which will generate savings of around €312 million compared to hard engineering solutions [12].

References

1. EEA Economic losses from climate-related extremes in Europe. 2022.
2. Krameer, K and Ware, J (2021) Counting the cost 2021 - A year of climate breakdown. Christian Aid, London.
3. McVittie, A., et al., Ecosystem-based solutions for disaster risk reduction: Lessons from European applications of ecosystem-based adaptation measures. International Journal of Disaster Risk Reduction, 2018. 32: p. 42-54.
4. EEA, Nature-based solutions in Europe: Policy, knowledge and practice for climate change adaptation and disaster risk reduction. 2021, European Environment Agency: Luxembourg: Publications Office of the European Union.
5. Asselman, N. and F. Klijn, Making room for rivers: quantification of benefits from a flood risk perspective. E3S Web of Conferences, 2016. 7: p. 12001.
6. EEA, Water-retention potential of Europe's forests. A European overview to support natural water-retention measures. 2015, European Environment Agency: Copenhagen.
7. Ferreira, C.S.S., et al., Nature-Based Solutions for Flood Mitigation and Resilience in Urban Areas. 2021, Springer International Publishing. p. 59-78.
8. Zölch, T., et al., Regulating urban surface runoff through nature-based solutions – An assessment at the micro-scale. Environmental Research, 2017. 157: p. 135-144.
9. Antolini, F., et al., Flood Risk Reduction from Agricultural Best Management Practices. 2020. 56(1): p. 161-179.
10. Schwaab, J., et al., The role of urban trees in reducing land surface temperatures in European cities. Nature Communications, 2021. 12(1): p. 6763.
11. Pinke, Z., Long decline in soil moisture urges restoration of European wetlands. 2022: Global Land Programme.
12. LIFE Endure Project, https://www.interreg2seas.eu/nl/endure.

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