MAINSTREAMING OF BIODIVERSITY IN THE FORESTRY SECTOR

The Case of VERENIKE - enhancing biodiversity and forest resistance against forest fires

Case highlights

Instead of planting monocultures in post-fire restoration of forest ecosystems, the VERENIKE project showed that post-fire reforestation may be implemented with a large number of different species, in order to increase resistance against forest fires and enhance biodiversity of burnt forest ecosystems.

Issue addressed

Each summer forest-fire is becoming a more prominent issue all over Europe, particularly in the Mediterranean. While globally some 90 percent of fires are caused by humans, climate change, characterised by drier weather and longer fire seasons[1], leads to more fires becoming "wildfires". The Western Balkans and NEAR East and South regions are becoming more and more vulnerable to such wildfires.

In addition to substantial economic and social impact on the communities exposed to wildfires, wildfires have an unquantified ecological impact, including the degradation of forests, soil erosion and loss of fertility, a decline in biodiversity and the emission of greenhouse gases.[2]

There are disparities and differences among countries in managing forest fires. However, in most cases the post-fire management of burned areas has been given much less attention than fire suppression and prevention; usual practice of active restoration is limited to planting only a few species that can be easily produced on a large scale, resulting in a 'restored' ecosystem characterised by low biodiversity.

Approach followed

The VERENIKE project recognized that conditions of a wildfire are favourable to regeneration. The project focuses on developing a new methodology involving the germination and cultivation of a wide range of forest species in mini-plugs[3] for post-fire restoration of forest ecosystems. This was the first time in Greece that seedlings of a great variety of species have been used to reforest burnt areas.

The first step was the collection and handling (cleaning and storing) of more than 65 kg of seeds from 26 targeted Mediterranean species (shrubs and trees), including the development of cultivation manuals for seedlings in mini-plugs. A prototype system was constructed, with the capacity to produce numerous high-quality seedlings for a variety of the targeted species throughout the year (more concretely, between 20 000 and 75 000 seedlings per cultivation period during the project duration). In the field, the project reforested three pilot areas using seedlings from the 26 targeted Mediterranean species (18 different species at each site). The survival and growth characteristics of the transplanted seedlings were monitored for two years to assess the success of the developed methodology, and the ability of the species to overcome transplantation shock and adverse field conditions.

[1] *https://www.fao.org/3/cb6627en/cb6627en.pdf*
[2] *https://hdr.undp.org/system/files/documents//riskproofingthewesternbalkanspdf.pdf*
[3] A plug plant is a seedling that was sprouted and grown in a small cell. Plug plants are often grown together in a large tray with many cells. Plug plants grow easier than starting plants from seed.

Benefits obtained

The project demonstrated that a large number of different species may be used to regenerate burnt areas. Nevertheless, the characteristics of the regenerated sites and the species that are aimed to be planted are crucial and determine the success of the regeneration effort. The project also provided guidelines as to which species are more suitable for each site, as well as germinability protocols for 22 Mediterranean forest species.

Best practice lessons

In order to enhance biodiversity and increase the forest ecosystem resilience, as many different forest species as possible should be used, bearing in mind they are native to the ecosystem.

On a strategic level, a holistic approach should be promoted, by developing integrated solutions which take into account the objectives of forestry, urban and rural development, agricultural, climate and energy policies to ensure that wildfires are managed in such a way that the safety of people and housing, economic growth and ecosystem services are maintained or increased.

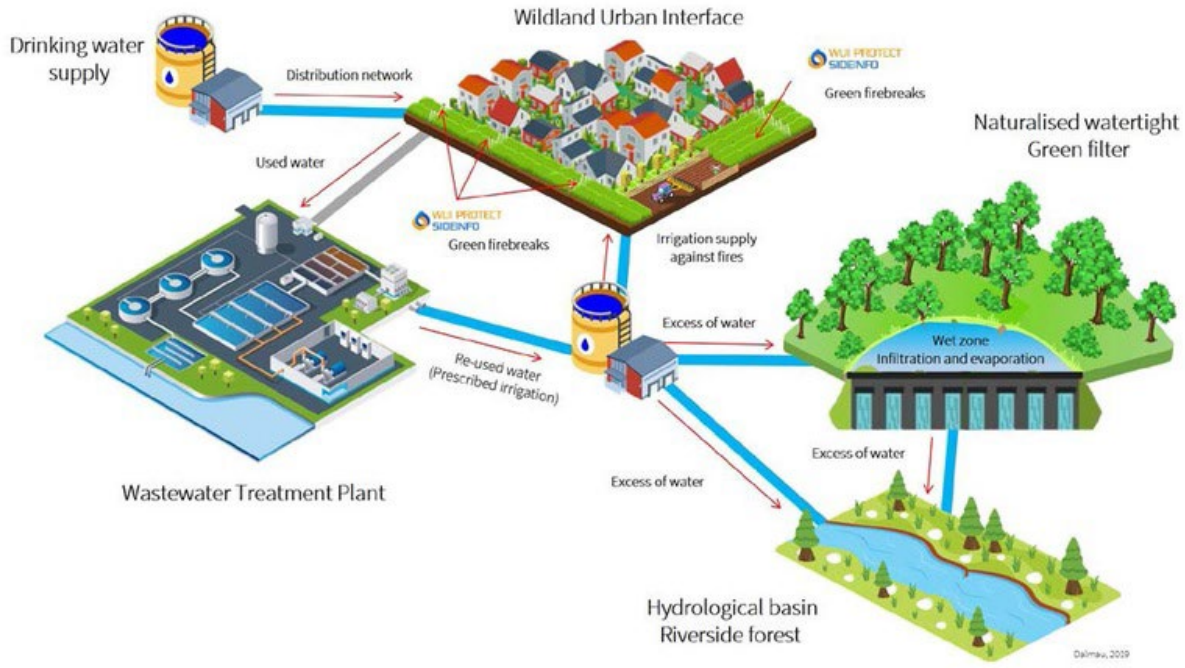
Elsewhere: *Building fire resilience using recycled water, SPAIN*

In contrast to the VERENIKE example which deals with post-fire management, this project focuses on reducing fire risks while providing a safe natural environment for citizens.

Fires in wildland-urban-interface areas are exceeding fire-fighters' capacities to respond simultaneously to wildfire suppression, community evacuation and structure protection. Recycled water is used to increase the resilience of forested area around a town of 15,000 against forest fires. Projects to design, build and maintain green firebreaks, reusing water from the urban wastewater treatment plants, can prevent the advance of fire in the urban-forest interface area. It consists of building hydraulic infrastructure, including a water treatment station for the elimination of microcontaminants. The reclaimed wastewater is also used to improve the water quality of an existing wetland. Green firebreaks consist of low flammability strips of vegetation of strategically planted fire-resistant trees, designed in a way to form transitional 'green belts' around the urban area. Groundwater recharge is an additional benefit.

Source: Climate ADAPT, Case study

The Green bridge on D2 motorway (Slovakia) to restore animal migration in the Alpine-Carpathian corridor.
https://www.youtube.com/watch?v=VMPS86qJMxI



Detailed scheme of the hydraulic system and its components. *Source:* The GUARDIAN project Journal N° 1. *https://www.uia-initiative.eu/sites/default/files/2020-06/Riba%20Roja_GUADRIAN_Journal%201.pdf*

Additional information

- *EC, 2018, FOREST FIRES - Sparking fire smart policies in the EU*
- *FAO, 2006, Fire management Voluntary guidelines: Principles and strategic actions*