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"Our Climate Ready Future"

Poster Abstracts

Biodiversity, ecosystem services and nature-based solutions

Poster 90: The Green Link project: Restore desertified areas with an innovative tree growing method across the Mediterranean border to increase resilience.

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The Green Link aims to demonstrate the environmental and economic benefits of an innovative tree growing method that has the potential to restore desertified areas across the Mediterranean border.
Mediterranean societies are increasingly facing floods, water scarcity, heat waves, prolonged droughts, flows variability, temperature rises and decreased rainfall with related impacts on vegetation. The impact of these phenomena is expected to intensify the existing risks of desertification and forest fires, particularly in regions where water scarcity is already a concern. Developing adaptation measures aimed at reducing the vulnerability of these ecosystems and strengthening their resilience is therefore of crucial importance.
The Green Link project seeks to contribute to the development of effective adaptation strategies across the Mediterranean region by testing an innovative growing method to restore desertified areas. This consists of replacing traditional irrigation techniques with the Cocoon, a water-efficient, low-cost and 100% biodegradable device.
Through six trials in extremely vulnerable areas in Spain, Italy and Greece, the project will:

1. Demonstrate that Cocoon technology can help combat desertification and climate change in the Mediterranean while providing a competitive market alternative to traditional irrigation.
2. Demonstrate the economic feasibility of an improved and more sustainable technology to plant trees without the use of irrigation.
3. Design specific ecological interventions (study of assisted migration of species) for a more efficient adaptation to climate change and enhance ecosystem services, particularly in relation to soil quality improvement and biodiversity.
4. Integrate novel methodologies to measure biodiversity, soil carbon stock, soil loss and human well-being while allowing for the assessment of climate change impact and resilience in the future.
5. Map ecosystem services for adaptation strategies in order to gain a better understanding of the positive outputs of the project.

Expected results include:

1. 90% survival rate after planting for all the species selected and savings of up to 50% for planters (taking into account maintenance and repositioning costs) vs traditional methods in these areas.
2. Soil quality improvement by 20% due to improved water retention, and further green cover, microorganism and mycorrhiza.
3. Increase of biodiversity by at least 15% and positive growth of soil carbon stock over time.
4. Comprehensive modelling and mapping of local ecosystem services.
5. Replicate the project experience and increased awareness and dissemination of adaptation strategies on forest management among stakeholders (particularly on EU relevant legislation and objectives).

Significance of your presentation to adaptation practice, policy and/or business?
This project is presented as a case study that puts adaptation strategies into practice. The project will plant trees in eroded areas that will contribute to reverse degradation of European soils by improving soil quality and allowing natural restoration of other vegetation. The combination of specific species of trees and the

Cocoon technology will allow for erosion control by protecting nutrients, water supply and soil cover. Furthermore, assessment of ecosystem services and their complex interactions with socio-economic variables and human wellbeing will be implemented. The Green Link LIFE15/CCA/ES/125 is co-financed by the EU through the LIFE program (01/07/2016 - 31/03/2020).

Poster 91: Increased resilience and climate change adaptation through catchment process restoration

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It is predicted that under likely future climate change scenarios, the magnitude and frequency of extreme events will increase, which will also lead to reduced overall societal resilience. This will compound the problems that are caused due to the fact that many of our catchments worldwide are already more prone to generating flood and drought conditions due to historic artificial interventions.

Large areas of our landscape have been greatly altered after centuries of human activity across the globe. Such changes include deforestation, increased land drainage, surface mining, the straightening and embanking of rivers, the dewatering of wetlands and, critically, the establishment of intensive agricultural practices. In natural catchment systems (before human intervention) densely vegetated areas with deep absorbent soils catch and hold rainwater where it can slowly seep through the land and recharge groundwater reserves. Artificial changes have stripped away many of the natural environmental and ecological systems that have evolved and now 'drain' and degrade our catchments, increasing pollution, erosion and sediment transport, and flood and drought risk. Without efforts to restore catchment processes our drought, flooding, food production, biodiversity and infrastructure resilience will reduce. An example of this is that incremental increases in flooding magnitude will essentially 'erode' the standard of protection of our flood alleviation schemes if left unmanaged. Iterative NMF interventions have the capability to absorb increasing climate change induced pressures, and at least maintain a resilience status quo.

This paper explains how the principals of Natural Flood Management (NFM) and 'Catchment Process Restoration' can be used to adapt to climate change scenarios, and to increase levels of infrastructure resilience. Additionally, such approaches result in a more sustainable situation that delivers a whole swathe of ecosystem services benefits such as increased food production, improved biodiversity, improved aesthetics and property values, infrastructure resilience and climate change mitigation. Together, these benefits ultimately lead to economic, societal and infrastructure resilience, which is increasingly important as the global population increases and becomes increasingly concentrated in urbanised locations. Examples will be given from numerous catchments in the UK and elsewhere in the world.

Significance of your presentation to adaptation practice, policy and/or business?
The restoration of environmental processes at the catchment scale can confront the negative impacts of climate change in a tangible way that delivers a whole swathe of other benefits. Such approaches, including Natural Flood Management, allow iterative adaptation in the face of uncertain climate change and are increasingly being placed into catchment management policy in UK and abroad. Scientifically-informed catchment process restoration increases economic resilience through reduced costs associated with floods, droughts and food scarcity. Restored catchment processes allow societal systems to be built on a stronger fundamental foundation, which will improve the conditions for successful business, and business growth.