

Management Plan for Better Resilience to Climatic Changes in Agricultural and Rural Areas

Researchers from the Whitaker Institute at NUI Galway are implementing the RiskAquaSoil project, which aims to develop a comprehensive management plan for risks in soil and in water to improve the resilience of the Atlantic rural and agricultural areas.

The Atlantic Area presents high risk to climate change with increased intensity and frequency of storms, drought and flooding and all having implications for the agricultural sector. This is leading to huge uncertainties in the way climate change will directly and indirectly affect agriculture and food systems.

The principal aim of RiskAquaSoil is to alert society to the fact that climatological disasters can and will happen during a lifetime. The project proposes simpler and more efficient tools and services for managing the more harmful risks in different parts of the Atlantic Area of Europe, stretching from Ireland to Andalusia. The project is inviting local communities to participate, adopt and apply the current solutions provided to address these issues, and to understand what political and local levers can be triggered to allow these new principles of management for a better resilience to climatic changes to be applied in the fields by farmers and rural people.

Dr. Sinead Mellett, a Postdoctoral researcher in the School of Business and Economics at NUI Galway, said: “The RiskAquaSoil project will contribute to a better coordination for the detection, risk management and recovery for rural areas, maritime and terrestrial areas, especially for agricultural purposes that are mainly associated to climate change and natural hazards but also to human pressure. Climatic changes are slow on average, but at the extremes they seem to be becoming more frequent. This slowly changing average prevents us changing proactively and we end up reacting after disasters, such as recent fires in Greece and the earthquake and tsunami in Indonesia.”

The project partners will combat the adverse effects of the impact of climate change, especially on agricultural lands. This integral plan will entail three stages linked to three specific objectives:

1. Early warning and diagnosis: testing new low-cost remote methods to measure and forecast the local impact of different meteorological phenomena. These techniques will provide accurate data that will result in a better early detection system in rural areas. Diagnosis activity will be enlarged with climate change scenarios such as frequency of heatwaves, droughts and flash floods, including forecasts and the improvement of climate information services to farmers.
2. Implementation and adaptation: developing several pilot actions in agricultural lands that will permit better soil and water management taking into account the risks associated with climate change, such as flood risk maps and soil erosion risk solutions. It will also include pilot actions in maritime areas such as soil erosion management, small storm catchment and farm management practices.

3. Capacity building and dissemination: training and commitment of local communities and farmers for increasing capacity building, information and cooperation in risk management and damage compensation systems.

Previous research carried out by Dr Sinead Mellett revealed that farmers did not proactively seek out information on climate change unless it was a regulatory requirement, a customer request or was going to have a potential economic benefit to the business. It also highlighted that engagement with advisors and farming networks is a 'huge' influencing factor for information, survival, growth and support for the farmer. A pilot study carried out in Ireland revealed that farmers in Ireland are concerned about severe weather events, and the effects on their farm. The research finding also showed that the majority of farmers are willing to adapt compulsory measures to better adapt their farm to climate change. The results will inform a larger survey, conducted on behalf of RiskAquaSoil to determine farmer's perceptions and attitudes towards climate change.

The NUI Galway-led RiskAquaSoil project is an EU INTERREG Atlantic Area Cooperation Program supported by European Regional Development Funds and with associated partner, Teagasc. The other countries partnering on the project are France, Portugal, Spain and the United Kingdom.

Some of the work on the project to date include:

Remote sensing training action

In Galicia, the CSIC team has installed, in two vineyards, soil erosion monitoring traps in order to quantify the benefits for soil protection of innovative vineyard floor management practices

Climate tendencies

ACMG analyzed representative climatic data from multiple Atlantic zones, for the last 30 to 50 years. The proximity to the ocean is noticeable with an average minimum temperature of 5.5°C in Mullingar (Eire), 8.7°C in Agen (France) and 10.4°C in Amareleja (Portugal). An increase in the annual average maximum temperature is distinguishable, from +0.3°C in Valentia (Eire), +0.7°C in South-West Devon (UK), +1.2°C in Agen (France), +0.8°C in Lourian (Galicia Spain) and +1.3°C in Amareleja (Portugal). The precipitation shown no tendency, with zones in Portugal with a 12.8% increase and others in Galicia, Middle-Garonne and Devon with a -0.5% decrease. The average thermal daily amplitude varies in summer from 5.6°C in Valentia (Eire) to 13°C in Amareleja (Portugal) while there is 11.2°C in Bergerac (France). That amplitude is increasing in 7 places (+0.1 to 1°C) and decreases in 1 (-0.4°C) while staying stable in 2.

Westcountry Rivers Trust catchment trials

The Westcountry Rivers Trust has been running three catchment scale trials in Devon. The first is a water quality acid remediation trial reducing the high pH spikes, the second is a water quantity natural flood management trial buffering flows and the third is trailing a new low cost telemetric monitoring probe to assess water quality and quantity.

Watercourses Monitoring after Wildfires

After the wildfires that affected Portugal in 2017, a watercourses monitoring campaign was initiated in 10 sampling points chosen based on the size and percentage of burnt area of the watershed. These monthly campaigns will detect changes in water and sediment properties in a post-fire scenario, and, if any, establish the persistence of these effects.