## RURACTIVE OPEN CALL - CHALLENGE 7

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| **Title of the challenge** | **Innovative Tools for Fire Risk Monitoring** |
| **Dynamo (pilot location)** | Diputación de Zamora, Spain |
| **RDD (Rural Development Driver)** *addressed by the challenge* | Sustainable agri-food systems and ecosystem management |
| **Overall context description and specific context to be addressed by the challenge** | In recent years, the province of Zamora has been the scene of several forest fires that have led to the eviction of villages as well as causing serious environmental damage. These fires reflect a growing vulnerability, exacerbated by climate change that has made summers drier and hotter, increasing the risk of fires in areas with unmanaged forests and undergrowth, especially in the western part of the province, which borders Portugal.<br>In addition to climate change, there is also a reduction in human and livestock presence and the accumulation of uncleared undergrowth. These heavily forested areas are vulnerable to fires that can spread rapidly and cause extensive damage to both the countryside and local communities. Currently, municipalities do not have fire detection and response methods in place on their own, leaving local authorities at a disadvantage to respond quickly and efficiently.<br>While the local infrastructure and resources available from the Junta de Castilla y León (regional authority), and the fire stations of the Diputación de Zamora, are sufficient, the lack of innovative technological tools for early detection and real-time monitoring remains a challenge for municipalities, their inhabitants and local businesses. |
| **Scope of the Challenge** | Implement an early detection system to monitor environmental conditions in real time and predict forest fires in vulnerable areas of the province of Zamora, particularly in the municipalities located in the cross-border area with Portugal.<br>The solutions should be scalable (e.g. from a single municipality to a joint of municipalities), easy to implement and have a community component to ensure the active participation of the local population, especially women, |

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| | groups at risk of social exclusion, and those with higher levels of vulnerability, particularly in high-risk areas. |
| **Solution requirements** | We are looking for a solution that could use one or some of the following technologies:<br>• **IoT-based early warning systems:** sensors that monitor temperature, humidity, wind speed and other conditions relevant to fire prediction. These devices should be distributed at strategic points in the municipalities.<br>• **AI-based risk predictions:** real-time analysis of historical and current data to predict the likelihood of fires and detect high-risk areas.<br>• **Drone and satellite surveillance:** solutions enabling remote aerial coverage and detection of hot spots or incipient fires through thermal imaging.<br>• **Community fire warning apps:** intuitive mobile apps that allow local people to report risks and receive alerts about possible evacuations or changes in fire conditions.<br>• **Drones with automatic response systems:** drones equipped with systems for rapid interventions, such as dispersing fire-retardant material in the early stages of a fire.<br>To maintain year-round usefulness, wildfire monitoring solutions can be repurposed in winter for environmental risks like floods, landslides, and cold weather alerts. Additionally, they can support forestry maintenance, infrastructure monitoring, and community education on fire prevention and climate adaptation, ensuring continuous engagement and proactive risk management. |
| **Specific objectives and expected outcomes** | • **Strengthen early detection systems:** implement technological solutions to identify fire risks before they become a major threat.<br>• **Improve rapid fire response:** increase the capacity of the Diputación de Zamora fire stations, local authorities and local communities to respond effectively to forest fires.<br>• **Encourage collaboration between authorities and the community:** create tools that involve both the Diputación de Zamora fire stations and local authorities and the rural population in fire prevention, through direct communication and access to critical information in real time.<br>• **Develop a sustainable and scalable system:** ensure that solutions can be kept operational in the long term and can be transferred to other municipalities, or even to the regional public authority. |

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| **Available resources** | • There are public data on local weather conditions and fire patterns.<br>• Fire station infrastructure: There are trained personnel and equipment in the 3 fire stations of Diputación de Zamora located in western province, which could facilitate the implementation and operation of the technological solutions.<br>• Local municipalities and associations of municipalities will be involved in the implementation and management of the solutions, with the possibility of active participation of the local population. |