RURACTIVE OPEN CALL - CHALLENGE 20

Title of the challenge	**Smart water management solutions for drought-resilient agroecosystems**
Dynamo (pilot location)	Fiastra Valley, Italy (territories of the municipalities of Loro Piceno, Colmurano, Ripe San Ginesio, Urbisaglia, Sant'Angelo in Pontano, San Ginesio)
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	The Fiastra Valley is a sparsely populated rural district, covering a hilly area characterised by ancient settlements and agricultural land crossed by the Fiastra river. The land cover is mainly arable land, with a few forests occupying mostly riparian and high-inclination areas. It is located in the inner part of Le Marche region, in central Italy, at the foothills of the Apennine mountains. Drought and water scarcity are growing problems affecting crops in rural agro-ecosystems, which will be even more persistent in the coming years. The community needs affordable and replicable solutions to combat water scarcity and drought. By addressing water scarcity, the solution contributes to the climate adaptation of the local agro-ecosystem, with positive effects on the whole ecosystem and on the conservation of biodiversity. There is potential to collaborate with the municipality of Loro Piceno, one of the villages of Fiastra Valley, to experiment these solutions in the 'Aula di Terra', an agricultural field used for outdoor education owned by the municipality of Loro Piceno and managed by a local farm in collaboration with children from the schools of Loro Piceno for the shared management and maintenance of crops, a small field size, one hectare, cultivated with ancient species of wheat and fruit trees. The solution would plug into this existing network, fostering awareness and community inclusion.
Scope of the Challenge	Developing systems that enable smart water management, smart irrigation systems and efficient water collection systems in the agrifood sector to address the water shortages and droughts that will be most impactful in the coming years in our territories. Any innovative solution should consider

	water reuse and incorporate strategies to mitigate water evaporation, a key issue in agricultural water management and ecosystem management, also to protect local biodiversity. Solutions should be easily implemented and maintained in rural environments, replicable in different contexts, low tech, accessible and easy to use for different groups (farmers and older people).
Solution requirements	• Design a comprehensive software/app/tool for efficient and intelligent integrated irrigation and rainwater collection in agricultural fields (e.g. rainwater harvesting, water storage, grey water recycling).The system optimises rainwater distribution and storage in case of intense rainwater events, taking into consideration the granulometry and orography of the ground (e.g. also developing a 3D model of an agricultural field, including geologic information).The system should consider possible nature based solutions. • Sensor-based decision support systems for farmers to maximise intelligent irrigation and reduce consumption and dispersion. The tool predicts drought conditions and optimises water use based on weather forecasts and crop needs using smart sensors that monitor soil moisture and weather conditions. • The solution should be easy to use and low-cost, ensure open access, and utilise open data sources.
Specific objectives and expected outcomes	• Mitigate water consumption and make the use of water for agriculture more efficient. • Make the local agro-ecosystem more climate adaptive and resilient to drought. • Increase local awareness to water scarcity and climate adaptation. • Foster inclusion and participation.
Available resources	• Availability of a test plot belonging to the municipality and already in use for the shared management and maintenance of crops. • Support in gathering regional and local data. • Agronomic and agricultural competences. • Existing technical support from the local municipality.