RURACTIVE OPEN CALL - CHALLENGE 23

Title of the challenge	**Wastewater treatment system**
Dynamo (pilot location)	Zadar archipelago, Croatia
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 islands of Zadar represent a unique agricultural landscape characterised by small land areas and fragmented ownership. Traditional farming practices are prevalent, especially since the islanders are often unfamiliar with modern farming techniques and the potential benefits of alternative methods. Therefore, arable land is scarce and degraded, due to excessive land use, as well as unfavourable pedological and climatic conditions. Water scarcity makes the agricultural situation even more difficult. As there are no natural freshwater sources, the community relies on water transportation from the mainland (by means of water carriers), which limits irrigation options and discourages significant investment in agriculture. As a result, most of the food is imported, although there is a great potential for ecological agriculture development. Additionally, the wastewater produced on the islands is usually disposed of in septic tanks in porous karst soil, which leads to pollution of the sensitive marine environment, and it further impairs local biodiversity. In the context of the above, innovative approaches are needed to foster a shift toward more sustainable, regenerative agriculture and alternative food production systems. There is a need to explore how wastewater, such as that produced by public building (school), could be reclaimed and safely repurposed for irrigation and nutrient delivery in agriculture. There is also a need for increasing awareness about grey water reuse, and potentially scaling the approach to households across the islands, as well as the other islands which make part of archipelago.
Scope of the Challenge	The challenge seeks to address the island's water scarcity and soil degradation by exploring possibilities for innovative reuse of wastewater from the elementary school on Silba

	island, to transform it into a valuable resource for irrigation and nutrient delivery in local agriculture. There is a need to empower the island community by introducing regenerative agricultural practices and enhancing resource efficiency, which can eventually be scaled to other public buildings and households across the Zadar archipelago. Key limitations include the island's isolated geography, and the need to ensure water quality and safety for agricultural use.
Solution requirements	Solutions should be focused on: • Implementing small-scale, cost-effective wastewater treatment system capable of treating reclaimed water from the public building on the island • Design made in a modular and scalable way • Prioritizing low-maintenance, decentralised system suitable for remote island environments • Capability of removing harmful contaminants, pathogens, and other pollutants, making the water safe for soil and crops, while retaining nutrients beneficial to plant growth
Specific objectives and expected outcomes	• Implement a system that reclaims wastewater from the island's elementary school, addressing the island's water scarcity (O: Increased amount of reclaimed water) • Introduce modern, low-impact agricultural techniques (in irrigation and nutrient delivery) to maximise resource efficiency, reduce environmental strain and contribute to biodiversity protection (O: Improved soil health and irrigation efficiency)
Available resources	• Cooperation with the local school and community partners • Identification and allocation of optimal city-owned agricultural land to facilitate the testing and implementation of proposed solutions