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**INNOVATIONS IN ANIMAL SCIENCES:
SHAPING THE WAY
FOR A SUSTAINABLE FUTURE**

Campus SAMEV

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ASPA 25th Congress Book of Abstract

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ecosystems provide numerous benefits. This condition is achieved by safeguarding, sustainably managing, and restoring both natural and human-modified environments, ultimately enhancing biodiversity and improving human well-being. These solutions serve multiple purposes, offer no downsides, and address critical challenges such as climate change adaptation, disaster risk reduction, emissions reduction, improved air, food, and water security, biodiversity conservation, and human health, besides being essential for sustainable economic growth. Within this context, CARDIMED project, funded by the Horizon Europe Programme, is focused on boosting Mediterranean climate resilience through widespread NBS adoption across regions and communities. The NBS approach of CARDIMED will be tested in 9 selected Demonstration Sites, distributed among Portugal, Spain, France, Italy, Greece, Turkey, and Cyprus, covering a diversity of Mediterranean region framework, challenges and technologies. Particularly, the Demonstration Site located in Sardinia (Italy) will be focused on the decarbonisation of agricultural practices and the reduction of agriculture-derived pollution by connecting crop field cultivation with different types of aquaculture techniques. In Sardinia, agriculture is one of the most important sectors in terms of economy and employment, but still heavily rely on irrigation, leading to substantial greenhouse gas emissions. In addition, this area is drained into a delicate water body frequently experiencing eutrophication. To achieve the targets of water quality, energy and carbon footprint, the NBS in this Demonstration Site will include microalgae cultivation, crop rotation, precise irrigation methods, constructed wetland system and buffer strips, and aquaculture practices linked together within a strictly connected flow chart. Particularly, in the rural/peri-urban area of Alghero, phyto-depurated water coming from the crop field will be firstly collected in a free surface constructed wetland that will serve as a water basin for a tank-based aquaculture system intended for a fish species of commercial interest, the common carp. Differently, in the Calich lagoon, mussel farming will be exploited to depurate agricultural-derived river runoff before entering the sea.

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The RESILTROUT project: identifying genetic markers associated to disease resistance and heat stress resilience in farmed rainbow trout (*Oncorhynchus mykiss*)

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Starting from the '80 of the last century, the fish aquaculture sector has experienced a continuous growth and is now providing about half of the fish-based food products consumed globally. Its role is thus crucial to meet the increasing demand for food of the growing human population, which cannot be satisfied by fishing alone. In fact, currently most species are heavily overfished and fish availability is rapidly decreasing, with factors like pollution and climate change impacting further on marine ecosystems. In this context, aquaculture can contribute twofold by mitigating the overfishing on the one hand and by providing an invaluable source of proteins for human consumption on the other hand. However, intensive aquaculture requires a shift to more sustainable and climate-smart practices to mitigate its impact on natural ecosystems and to deal with the increasing temperatures caused by climate change. The RESILTROUT project is funded by the Italian National Recovery and Resilience Plan [PNRR] with the goal of enhancing the competitiveness and sustainability of the Italian trout farming sector. The study will target genetic traits associated to heat stress-resilience, resistance to lactococcosis and to proliferative kidney diseases (PKD) through case-control Genome-Wide Association Studies (GWAS). Within each of these three case-control studies 1,000 individuals (500 cases and 500 controls) will be genotyped with a SNP (single nucleotide polymorphism) array of about 50,000 markers. The same array will be used to screen 5000 candidate trout to identify carriers of resilience/resistance genetic variants to be used as breeders of the next generation. The results of this study will provide important contributions to improve the sustainability and competitiveness of the Italian aquaculture sector.

The project «RESILTROUT – aquaculture resilient to global change: research in support of Italian trout farming» (code 6-CFP) is supported by the Italian Ministry of Agriculture, Food Sovereignty and Forestry (MASAF).