Project Review: Ecological Sustainable Governance of Mediterranean Protected Areas ECOSUSTAIN

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Project Review: Ecological Sustainable Governance of Mediterranean Protected Areas ECOSUSTAIN

1. Project description and objectives

The ECOSUSTAIN Project represents a joint transnational action towards the maintenance of biodiversity and natural ecosystems by means of stronger management and networking of protected areas, that is National and Nature Parks, in the Mediterranean region. The overall objective of the Project is to improve the water monitoring process of protected areas through supporting scientific, technical and management knowledge in tackling the problem of incoherent and segregated management of protected areas as self-sustained units, which is believed to hamper the protection and promotion of Mediterranean natural resources, as well as the maintenance of biodiversity and natural ecosystems.

The Project is being implemented in 5 Mediterranean countries (Bosnia and Herzegovina, Croatia, Greece, Italy and Spain), during 30 months until 2019. The Project pilot implementation activities will take place in five Protected areas: the Mincio River Regional Park (IT), La Albufera Natural Park (ES), National park Una (BA) and National park Krka (HR) and the Ecodevelopment area Karla-Mavrovouni-Kefalovriso-Velestino (GR).

All these protected areas are heterogeneous and of different types, with different impacts and pressures on nature and waters. Una and Krka are mountain rivers, Minco and Abufera are lakes under the strong influence of human environmental activities (irrigation, wastewater...), lake Karla in Greece is a flood protection retention reservoir. Each of them plays a crucial role in determining water monitoring parameters and the selection of probe types and protocols for data exchange. However, the objective of all the protected areas is to reach the desirable status of impact control that should be

higher than today. To facilitate the decision making in respect of actions and methods to be used for that purpose, the GAP analysis is performed over the three main fields of action: a) management practice, b) monitoring practices and c) water quality and pressures. GAPs investigation showed how far from the desirable status each of the pilot areas is and what constraints on operational and management level are. Thus, the existing assessments of water quality, biodiversity and ecosystem services are compared, synthesized or combined by harmonized scenarios with different objectives, policy questions, assumptions, uncertainties, or by focussing on different temporal and spatial scales.

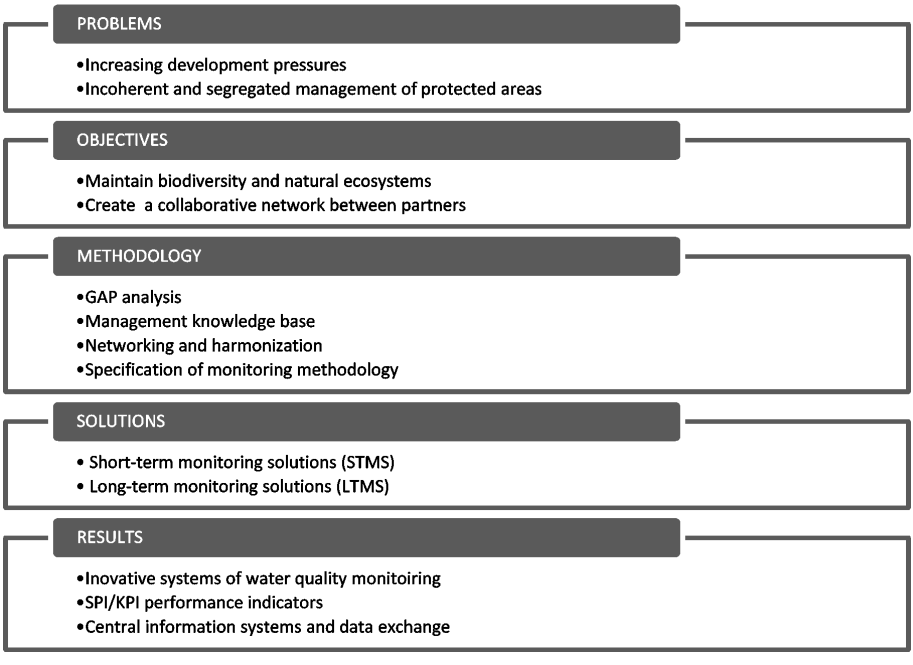

Figure 1 - Project breakdown

2. Technical tools and methods of water monitoring

The core activity within the Project is the development of a *short-term* and *long-term monitoring solution* that will improve water quality monitoring by means of the state-of-the-art ICT technology providing live, early warning messages directly from a sensor-equipped buoy or by means of long-term monitoring based on the satellite imagery processing.

The short-term monitoring solution (STMS) will provide live water quality monitoring by collecting data (e.g. pH, Ammonium, Blue-green Algae, Phycoerythrin,

Chloride etc.) from the water sensors installed on the buoys, processing data and notifying relevant recipient by push/pull notification via software and GUI for data visualization and configuration/e-mail /SMS etc. The long-term (LTMS) monitoring solution will include the development of methodology and integrated solution for satellite monitoring of environmental indicators via Earth Observation techniques and relevant satellite imagery pre-/post processing and classification and elaboration on the meta-information presented on the client GUI (graphical user interface).

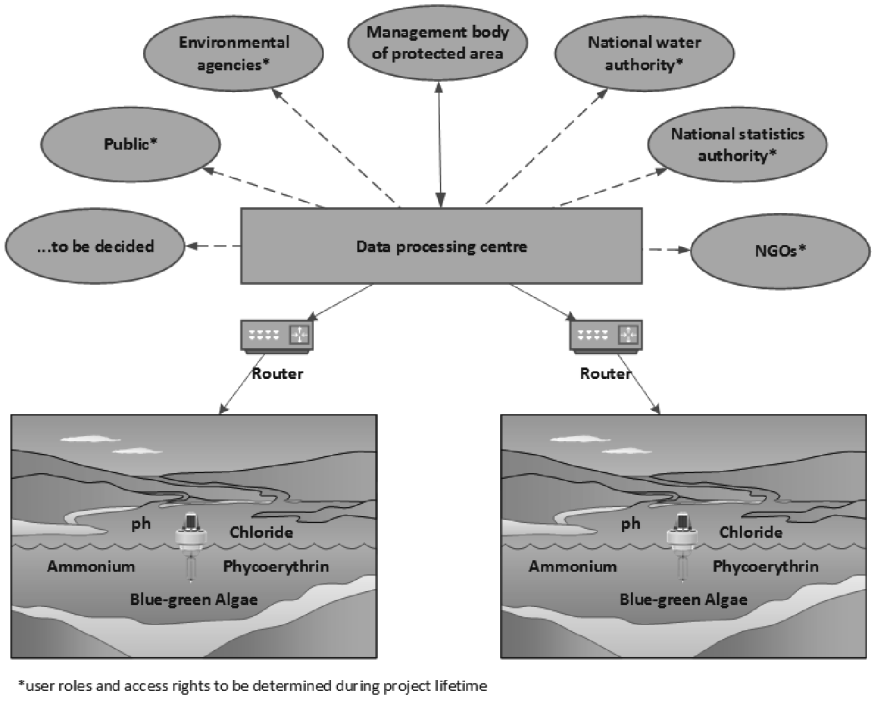

Figure 2 - Conceptual diagram of STMS

A short-term monitoring solution benefit is the possibility of constant monitoring (15-minute interval) of key physical, biological or chemical parameters in real time as well as the accessibility and control of data via remote systems. The ICT system monitoring features offer the opportunity for upgrading the system by enabling early warning messages in cases when the warning is triggered when certain parameters reach the critical value or the given threshold. Collected data can be used also for selection, aggregation and for post-processing analysis.

The satellite remote-sensing (LTMS) provides complete, synoptic geographical coverage of water quality in inland fresh water systems (such as lakes, reservoirs, rivers, wetlands and dams). The satellite imagery originating from satellite optical sensors is

generally and publicly available yet with some limitations regarding the local weather condition (clouds, fog) which could occasionally minimize the imagery quality. The hereby supplementary choice of use of a Synthetic-Aperture Radar (SAR) sensor is considered a good one as it is independent of local weather conditions (clouds, heavy rain etc.) and can provide relevant imagery for water reservoirs in better quality and independently of local weather conditions. That is why satellite monitoring may be a good and effective methodology to use in EcoSUSTAIN and review/test it for further use by the management bodies of protected areas/natural parks.

3. Expected results

The Project will generate strengthening of the integrated management, cooperation, and networking between the protected areas, as well as significant improvements in the monitoring and management of water, which will result in an improved status of water quality preservation. Implementation of innovative technologies of water quality monitoring will be tested through a pilot demonstration in target areas. Certain parameters will monitor water quality in a 24/7 period by selected sensors and generated data will be transferred to a central system. The data will be obtained in real time, as to enable a timely reaction to any change or potential alteration that could disturb the quality of water. Management and networking of protected areas will be improved by elaboration and implementation of an Operations strategy and action plan: 1) Improvement of management knowledge base (how to train staff and allocate them, test and monitor implementation of regulations, utilize financing mechanisms etc.); 2) Specification of the monitoring methodology (how to monitor water quality by means of information and communication technology (ICT), define monitoring practices/protocol, which values/elements to monitor, propose site-specific 'green infrastructure" measures towards the improvement of water quality etc.); 3) Networking and harmonization.

The primary end users of the monitoring systems will be management bodies of the protected areas involved in pilot activities. However, by means of transferring actions in the Project and sustainable results, secondary end users will be other management bodies of protected areas across the Mediterranean. At the same time, the central information system will provide information sharing with various users, stakeholders and the public. For the first time, it will be possible to exchange data with other protected areas in the Mediterranean and together to track changes and create a high quality database.

4. Conclusion

Rapid environmental changes and urgent calls for sustainable management practices mean that the best knowledge possible is needed to inform decisions, policies, and practices to protect biodiversity and sustainably manage vulnerable

natural resources. “Ecological sustainable Governance of Mediterranean protected Areas via improved Scientific, Technical and Managerial Knowledge Base” can be a means for reaching the goal of maintaining ecosystems in a healthy, clean, productive and resilient condition, which also enables them to provide humans with the services and benefits they depend on. It can be considered as a tool for an Ecosystem-based management that acknowledges the connections, cumulative impacts, and multiple objectives existing in the area.