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## **NewLife4Drylands: remote sensing - oriented nature-based solutions towards a new life for drylands**

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According to the European Environment Agency (2008), the areas of Southern, Central and Eastern Europe showed “very high” or “high” sensitivity to desertification. One of the main drivers of desertification is climate change, affecting particularly the Mediterranean regions. Drought intensity and frequency are expected to increase with global warming in southwestern parts of Europe, whereas an opposite trend is projected for north-eastern Europe.

Nature-Based Solutions (NBS) can represent an effective approach for the implementation of drought impact mitigation measures at local level. On one hand, increased availability of satellite imagery and constant development of analytical techniques are stepping up monitoring processes at various spatial and temporal scales. On the other hand, short-term monitoring systems can be applied immediately after the restoration implementation but it is essential to evaluate the biophysical status of the restored areas at mid-term and long terms after the implementation.

NewLife4Drylands is a LIFE Preparatory Project co-funded by the European Union under the LIFE programme. It started on January 2021 and it will end in June 2023.

NewLife4Drylands deals with the specific need set by the “Life-Environment” subprogram “Restoration of desertified land through nature-based solutions” to contrast the soil degradation leading to desertification by using NBS. NewLife4Drylands focuses on developing a protocol based on remote sensing techniques for the identification of a framework for achieving land degradation neutrality (LDN), combating desertification and for a mid and long-term monitoring of restoration interventions on desertified lands. The protocol will be an instrument for a clear, specific and costless assessment of the restoration process useful for further decision-making concerning restoration interventions.

Six European areas (in Greece, Spain and Italy) affected by land degradation and desertification which either have NBS and restoration activities ongoing - implemented in the context of other LIFE+ or existing projects - or are candidate for restoration have been selected.

Free high resolution time-series data from Landsat and the Copernicus Sentinel satellites at high temporal repetitiveness (every 16 or 5 days, respectively) combined with high spatial resolution (30 or up to 10 meters, respectively) will be investigated for monitoring processes at various spatial and temporal scales. The new hyperspectral satellite PRISMA data from the Italian Space Agency will be considered for information integration. The availability of ground reference data will be essential for calibration and validation of satellite imagery analysis.

NewLife4Drylands will select a set of well-known indicators, such as spectral indices used as proxies for monitoring vegetation, water content, drought degree, primary production. Moreover SDG's sub indicator 15.3.1 (Proportion of land that is degraded over total land area) will be implemented at local scale.

Based on such indicators, NewLife4Drylands will define a monitoring model and a protocol able to connect NBS and remote sensing indicators which will provide a guide for the identification of specific measures of restoration of drylands to be used as a support in decision making for adaptive management of restoration actions in drylands, improving ecosystems services provision and related economic issues, including local resources to mobilize and new green jobs.

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