Operandum at a glace

Research for a more resilient Europe

OPERANDUM is a European research project that aims to demonstrate the efficacy of **sustainable solutions** inspired by nature to **adapt territories** to hazards derived from **extreme weather events**, such as floods, droughts, landslides and storm surges, making human communities more resilient to climate change.

Nature-Based Solutions Using nature to adapt landscapes

The frequency of severe hydro-meteorological events is rising in many regions of the world as a consequence of **climate change**. Society must be ready to make landscapes more resilient. **Nature-Based Solutions** (**NBS**) are inspired and supported by nature and provide environmental, social and economic benefits, while helping to **build resilience against climate change**. OPERANDUM has been built to deliver **tools and methods** to demonstrate the efficacy of a variety of **locally-adapted** NBS, involving **multiple stakeholders** in the process, such as citizens, associations, business players and policy makers.

The Geospatial Information Knowledge Platform

The project offers a **Geospatial Information Knowledge Platform** (GeoIKP) as an online **open hub** to exchange knowledge about Nature-Based Solutions. This way, OPERANDUM provides the basis to strengthen **adaptation policies** whilst boosting **new business opportunities** to build more resilient landscapes and communities.

Find out more

- www.operandum-project.eu
- info@operandum-project.eu
- www.geoikp.operandum-projet.eu

The project in numbers



International Open-Air Labs 10 areas to examine Nature-Based Solutions

OPERANDUM **tests the efficacy** of multiple NBS through 10 Open-Air Laboratories (OALs) distributed across the world. Based on the concept of **living lab**, the OAL is an original multidisciplinary framework that connects research institutes, enterprises and stakeholders to co-design, co-develop and co-deploy NBS. The OALs provide the framework to build **scientific evidence** of the efficacy of the NBS to mitigate the impact of hydro-meteo hazards, thereby enabling their replication and upscaling in other regions.



+39 051 209 0541

@OPERANDUM EU

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CHINA Shiyang River Watershed









Shiyang River Watershed

An OAL to test solutions for drought and land degradation

This Open-Air Laboratory is located at the Hexi Corridor, in Northwest China. Between the 1960s and the 1990s, this watershed was a highly claimed territory that experienced **extensive groundwater extractions**.

All of these human activities, as well as the **arid climate conditions** found in this area, make the Shiyang river watershed a very vulnerable region to the variability of climate change. In fact, now it faces **water shortage and land degradation**.



Co-creation of the NBS A whole area involved in the process

Operandum has collaborated with **local stakeholders**, particularly with officers from the local government, in the **design, development and implementation** of this NBS. Several field surveys and onsite or online workshops were developed to promote the acceptance of the proposed NBS by local farmers.

If you want to find out the updated results, visit www.geoikp.operandum-project.eu

Natural tools to prevent desertification

An NBS to improve resilience of drought and land degradation.

Operandum has used **microorganisms** and integrated **water resources management to mitigate drought** and land degradation on a basin scale.



1. The Shiyang river watershed is located within an **arid climate zone** with **scarce average rainfall**. As a result, this region suffers from dust storms, soil salinization, freshwater shortage and drought.

2. To reduce drought, Operandum has identified and tested three different **rhizobacteria** that **promote plant growth**. The first results indicate that these microorganisms can increase plants' **drought tolerance** in the research area.

3. Optimisation of water resources is being achieved by using a regional **scale estimation of water consumption**, at the ecological and economical level. Remote sensing models are also being used to **quantify the efficiency of water use** in different regions.

4. The **performance** of these solutions is being **monitored by experts**, and is shared through workshops with local technical engineers, officers and farmers. This **co-design approach** promotes the **acceptance of NBS** by stakeholders.