REXUS Project Pilot Areas:

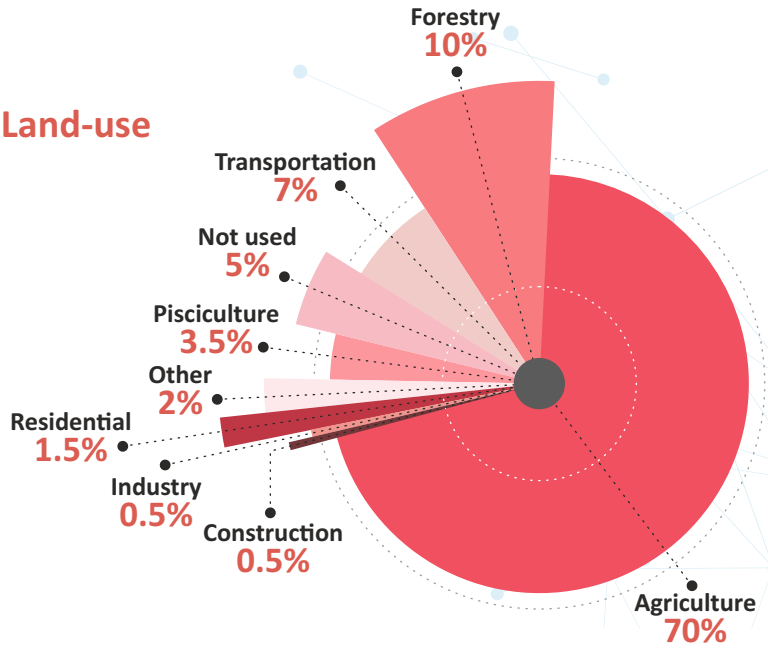
Lower Danube (Romania, Bulgaria, Serbia)

Integrating solutions through participatory approaches:
Enhancing Lower Danube´s Water-Energy-Food-Climate Nexus resilience

The REXUS project aims to assess the Water-Energy-Food-Climate Nexus of the European Lower Danube River system through an integrated analysis, working with stakeholders to overcome administrative barriers, to improve the local population's living conditions. The Lower Danube area faces significant challenges, such as the continued exploitation of the Danube River resources, especially for navigation, hydropower production, and the higher water quotas for agricultural irrigation, especially during periods of drought. As a result, the water level may drop below the safety margin. Therefore, local communities may be forced to rely on groundwater resources, which are also limited, for drinking water supply.

General Characterization

Land-use



- **Total population:** > 1.2 million inhabitants.
- **Area:** 236,930 km² (29% of the total Danube basin area of 817,000 km²).
- **Climate:** Temperate (rains occur throughout the year, hot and dry summers, annual average temperature 11.5°C).
- **Precipitation:** West to East decreasing trend, from over 600 mm/y to less than 500 mm/year in the East Romanian Plain and about 350 mm/year in the coastal region.

REXUS Goal

The main challenge to overcome is the continued overexploitation of the Danube river's water resources. A critical factor to be included in the WEFC Nexus analysis is sustainable exploitation, as it generates less impact on the natural environment and improves ecosystem services.

Activities related to flood risk management, such as cost-benefit analysis, economic, social, and environmental impact assessment, and land use planning, require better coordination by Nexus stakeholders.

REXUS plans to bring together key stakeholders from government institutions, such as ministries and national administration, local administrations, NGOs, insurance companies, and citizens, with the aim of overcoming some of the expected bottlenecks, such as lack of transparency, high bureaucracy, and divided decision-making, through the implementation of REXUS project measures.

How will REXUS work?

The REXUS project integrates methodologies and techniques such as Stakeholder Engagement, System Dynamics Modelling (SDM), Earth Observation (EO), climate risk assessment, socio-economic and policy analysis.

One of the critical aspects is Stakeholder Engagement which is essential for the project's development and is built on two principles:

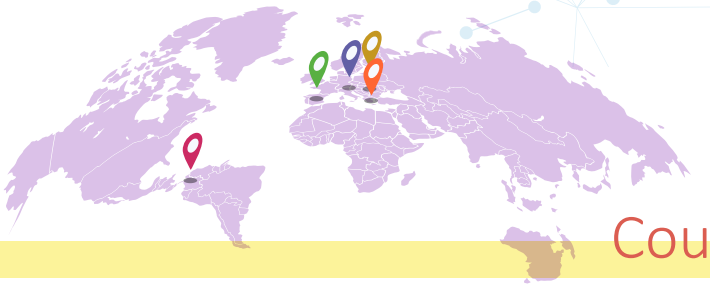
- **Building local relationships:** The active cooperation of stakeholders from national institutions, such as the Ministry of Agriculture, Ministry of Water and Forests, Ministry of Transport, Ministry of Regional Development and Tourism, National Meteorological Administration, Romanian Waters National Administration, and Environmental Guard, as well as Lower Danube River Administration, local administrations and NGOs, down to small farmers and citizens, improve the understanding of the REXUS project and contribute to the development of strategic decision making.
- **Active pilots participation:** Cross-fertilisation with the other REXUS pilots will take place throughout the project stages to share a standard view on the proposed solutions and validate them.

Future perspective: Call to Action

"The challenge for the future is to maintain a dynamic balance between the development of human activities, industry, and the natural environment in the Danube Basin.

Most of the land along the riverbank is now under the administration of private owners, which presents an important challenge to initiatives that the local authorities may have concerning the maintenance and development of the pilot area."

Albert Scrieciu, GeoEcoMar



GeoEcoMar®

Country pilots Regional Team

GeoEcoMar is a research and development institute created in 1993 under the Romanian Ministry of Education and Research coordination. GeoEcoMar represents the focal point of national excellence in research and consultancy on marine, coastal, fluvial, lacustrine geology, geophysics, and geo-ecology. Due to its technical capabilities and scientific performance achieved in a short period, the centre has become since 1996 an "Institute of National Interest", its primary research focus being the complex study of the Danube River-Danube Delta-Black Sea macro-geosystem. An essential part is to improve the state of the Danube River ecosystem by actively participating in research projects to develop better solutions for the threats facing the macro-geosystem.

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