

TRANSDISCIPLINARY RESEARCH IN eLTER RI – SOCIO-ECOLOGICAL RESEARCH PLATFORMS (eLTSER PLATFORMS)

eLTER recognises that addressing today's global sustainability challenges requires a new way of doing science. Transdisciplinarity and the Whole Systems Approach, the underlying conceptual frameworks of eLTER RI's Long Term Socio-Ecological Research (eLTSER) Platforms, provide such an innovative approach. eLTSER Platforms are spatially explicit living laboratories for conducting transdisciplinary, long-term, socio-ecological research. They are designed and operated with the specific goal of harnessing scientific research on human-environment interactions to address environmental challenges and facilitating sustainability transitions.



The Long-Term Socio-Ecological Research (eLTSER) Platform is a unique entity conceptualised, created, and operated by eLTER RI (Haberl et al. 2006). From its inception in 2004, the eLTER network adopted a transdisciplinary, whole-systems approach¹ to ecosystem observation and research (Mirtl et al. 2018). An LTSER Platform is a geographically-specific socio-ecological system (Fig. 1) in which interdisciplinary research teams work in collaboration with one another and with local stakeholders to define and address ecological and natural resource challenges. The overall aims of eLTSER Platforms are to 1) strengthen the social and policy relevance of eLTER Standard Observations and research at the local, regional and continental scales, 2) produce more robust sustainability research by catalysing inter- and transdisciplinary collaborations and exploiting a broad range of knowledge bases (e.g., local and professional knowledge, social sciences, natural sciences), and 3) improve ecological literacy of the public through engagement, citizen science and other participatory tools.

While each platform is unique in terms of the scientific expertise of the research team and the specific challenges they address, the research process within all platforms is defined by the following transdisciplinary qualities (Fig. 2):

- **Responsiveness:** The research agenda focuses on sustainability challenges as defined by the researchers in collaboration with local stakeholders (e.g., resource managers, farmers, policy makers, etc.).
- **Relevance:** The nature of research questions are designed to have direct policy relevance in order to maximise potential for uptake into planning, policy, and management.
- **Reflexivity:** Researchers, along with stakeholders, reflect upon the efficacy of their policy recommendations and remedies and assess successes and failures in addressing sustainability objectives.
- **Iterative research:** Research is an ongoing, long-term process that continues to address changing conditions and emerging challenges based on long-term data, assessments of policy and management interventions, and dynamic socio-ecological conditions.

Within the ongoing development of eLTER RI and in preparation to become a European Research Infrastructure Consortium (ERIC), eLTSER Platforms will enable a new generation

¹ eLTER's whole system approach ("Whole System Approach for in-situ research on Life Supporting Systems in the Anthropocene" or "WALLS") is based on a hierarchical, interdisciplinary research infrastructure design, which collects and analyses data across earth systems with particular emphasis on policy relevance and comparative research across ecological and socio-ecological gradients.

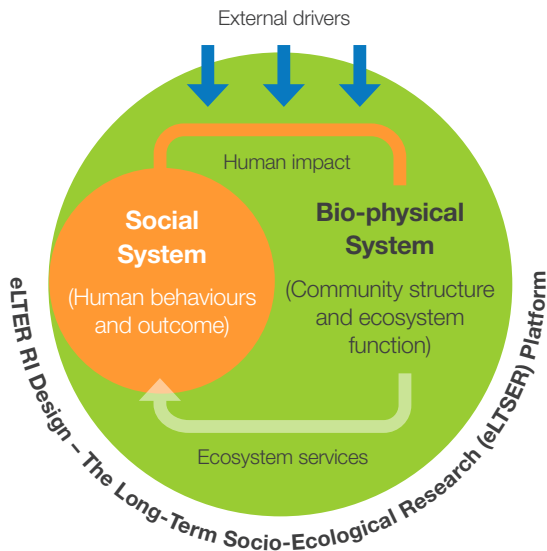


Fig. 1: Conceptualization of a single socio-ecological system consisting of the interactions of a social and a bio-physical subsystem with feedbacks.

of LTSER through a range of long-term structures and services. Amongst them is the systematic collection of long-term standard observational variables that reflect the state of, and changes in, socio-ecological systems in a harmonised fashion across all European platforms. Parallel to the collection of biophysical observational data at eLTER Sites within the eLTSER Platforms, data collected and prepared by platforms will also provide researchers and policy makers with insights into long-term trends and responses to policy interventions and change ecosystem conditions at the European scale. Other services comprise permanent communications platforms across relevant actor groups in the region etc.

Over the past two decades, LTSER Platforms have produced abundant research on socio-ecological systems across Europe and have contributed policy-relevant research and data to local and regional stakeholders (Dick et al. 2018). Among the more prominent examples include ecosystem service delivery in French agro-ecosystems

(Berthet et al. 2022), biodiversity and its links to ecosystem service provision and resource management (Gingrich et al. 2016), and collaborations on management plans in Scottish national parks in Scotland and Spain, and riparian ecosystems in Romania (Holzer et al. 2019).

As part of its obligations as a recognized RI on the European Strategy Forum on Research Infrastructures (ESFRI) roadmap, eLTER socio-ecological Platforms are currently undergoing a process of institutionalisation. This process includes explicitly defining the structure and function of the eLTSER Platform ("site specifications"), the standard observational variables to be collected across all platforms, and the mechanisms by which various platform activities will be performed, such as ensuring public accessibility to eLTSER services and data and collaboration with local and national stakeholders.

There are currently 52 active eLTSER Platforms at various stages of development across Europe, covering a large diversity of European terrestrial and aquatic ecosystems and the human communities that interact with them. eLTER RI sponsors and provides funding via transnational and remote access for researchers to utilise the RI resources (see: <https://elter-ri.eu/transnational-remote-access-ta-ra>).

FURTHER READING

- Berthet, E.T., Bretagnolle, V. Gaba, S. 2022. Place-based social-ecological research is crucial for designing collective management of ecosystem services. *Ecosystem Services*. Vol. 55.
- Dick, et al. 2018. What is socio-ecological research delivering? A literature survey across 25 international LTSER platforms. *Science of the Total Environment*. 622-623:1225-1240.
- Gingrich S, et al. 2016. Long-Term Socio-Ecological Research in Practice: Lessons from Inter- and Transdisciplinary Research in the Austrian Eisenwurzen. *Sustainability*. 8(8):743.
- Holzer, et al. 2019. Results from a Case Study Evaluation of Transdisciplinary Science in the European Long-term Socio-Ecological Research (LTSER) Network. *Biological Conservation*. 238:108228.
- Mirtl, M., et al. 2018. Goals and Achievements of Long-Term Ecological Research at the global scale: A critical review of ILTER and future implications. *Science of the Total Environment*. 626:1439-1462.

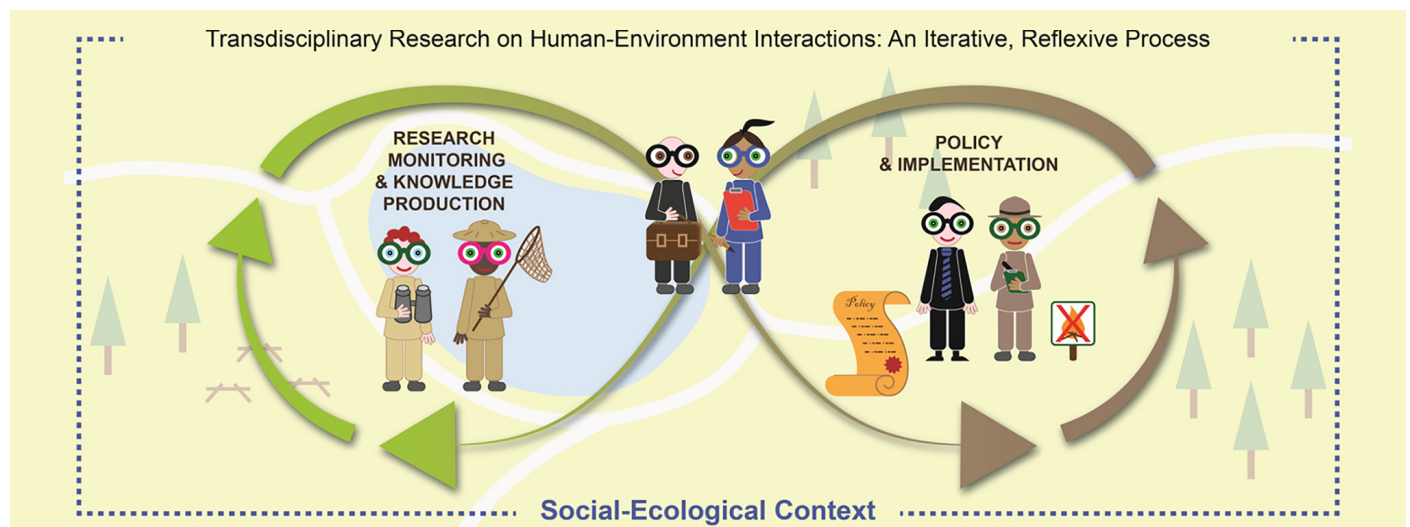


Fig. 2: The transdisciplinary research-policy framework for LTSER platforms (from Holzer et al. 2019).