The Challenge: An assessment framework for applied socio-ecological research

For over 20 years, scientists have been calling for the integration of social science concepts into ecological research. The International Long-Term Ecological Research (LTER) Network has answered this call with the establishment of a global network of long-term socio-ecological research (LTSER) platforms. These platforms have been formed as the infrastructure for conducting long-term socio-ecological studies with a focus on providing policy and management-relevant data for solving real-world environmental challenges (Haberl et al. 2006; Singh et al. 2013). LTSER enlists social scientists, practitioners, and stakeholders, retaining conventional ecological research while integrating socioeconomic research, in such a way that aims to help participants understand the complex of interactions, feedbacks, causes and effects throughout the socio-ecological system.

Yet, LTSER, as a new research paradigm, is in need of an assessment framework that will allow researchers and other stakeholders to determine the effectiveness of socio-ecological research in reaching its goals and leading society to greater sustainability. This need is reflected in a newly-initiated, EU-funded project – “eLTER H2020” – which aims to audit 36 LTSER platforms to survey their capacity to assess ecosystem services, with a particular focus on data collection infrastructure, analytic capacity, and production of evidence-based knowledge.

To address this lacuna, our research explores the foundations of socio-ecological research and transdisciplinarity, and compiles and analyzes various assessment frameworks proposed and applied to transdisciplinary research. Our goal is to develop, test and analyze a globally-applicable assessment framework for LTSER.

The Methodology: Selected approaches toward evaluating socio-ecological research

We reviewed evaluation approaches toward designing a methodology to assess socio-ecological research. The first two approaches are taken from planning and anthropology, respectively, while the latter three approaches were designed specifically for evaluating transdisciplinary research.

<table>
<thead>
<tr>
<th>Method</th>
<th>Description</th>
<th>Key Features</th>
<th>Advantages</th>
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<tbody>
<tr>
<td><strong>Integrated Evaluation</strong> (Alterman et al. 1984)</td>
<td>Multi-faceted approach to evaluate broad-aim social programs</td>
<td>Integrates evaluation methods of economists, political scientists, behavioral sociologists, and psychologists; clarifies relevant stakeholders and their criteria for program success</td>
<td>Provides decision makers with insights regarding processes and products of the project / program from various perspectives</td>
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<td>In-depth interviewing with a socially constructivist approach (Crossett et al. 2003)</td>
<td>In-depth interviews to elicit reflections from stakeholders that can be analyzed within their social contexts</td>
<td>Focuses on scientific quality, integration / synthesis, and project organization / management</td>
<td>Highly flexible method that can be easily adapted</td>
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<td><strong>Catalogue of Criteria</strong> (Defila &amp; Digiulio 1999)</td>
<td>A catalog of evaluation questions that can be mixed and matched to use in a highly flexible external or self-evaluation</td>
<td>None</td>
<td>Flexible but highly structured</td>
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<tr>
<td><strong>Quality Criteria of Transdisciplinary Research</strong> (Bergmann et al. 2003)</td>
<td>A catalog of evaluation questions for formative self-evaluation accompanied by a step-by-step protocol</td>
<td>Questions focus on how research relates to real-world problems and if there is quality of learning occurring in the research process</td>
<td>None</td>
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<tr>
<td><strong>Research Embedment and Performance Profile</strong> (Spaenj Concent and Bell 2007)</td>
<td>An in-depth, multi-faceted evaluation integrating researchers and stakeholders</td>
<td>Uses mixed methods for five categories of evaluation: 1) collaboration and visibility, 2) science and certified knowledge, 3) education and training, 4) innovation and professional achievements, and 5) public policy</td>
<td>None</td>
</tr>
</tbody>
</table>

The way forward: Assessing LTSER

Despite growing demand, there has been little formal evaluation of LTSER platform activities, neither in Israel nor abroad. We suggest that LTSER scientists of the “eLTER-H2020” project can draw from the literature on evaluating research and transdisciplinarity, and compiles evidence-based knowledge.

The Background: Transdisciplinarity as a foundation for creating applicable knowledge

Transdisciplinarity, in our selected framing, is a research approach that developed pragmatically to respond effectively to societal problems (Pohn & Hirsch Hadorn 2008). It allows a real-world problem to define the research question, and then synthesize data and knowledge from multiple disciplines as well as non-academic knowledge, gathered and integrated in a way that promotes novel and creative approaches to problem-solving.

Lessons from Transdisciplinary Science for Socio-Ecological Research in Israel

Jennifer M. Holzer and Daniel E. Orenstein
Faculty of Architecture & Town Planning, Technion – Israel Institute of Technology, Haifa, Israel

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