Sustainability Science: A guide for researchers

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This project is a dynamic **Research Guide** to the principal findings of sustainability science. The goal of the project is to provide a synthesis of research in the field that highlights its principle insights and their practical implications for the pursuit of sustainable development. We have shaped the project in a way that we hope will prove useful for graduate seminars in sustainability science, for established scholars seeking to locate their work within this sprawling field, or to catch up on important findings in parts that are not their own. We hope that it will help to catalyze new collaborations across distant parts of this rapidly expanding and evolving community of researchers working on the problem of sustainable development. The project is grounded in material we assembled as background for a brief review of sustainability science we recently published in *Annual Review of Environment and Resources*. (See entry on ‘Genealogy’ at the bottom of this page). We seek now to move substantially beyond that review, expanding and revising existing sections, adding new ones, and updating its principal findings in the light of rapidly expanding research in the field.

Our basic strategy for doing so is to build on our initial material through as an experiment in collaboration and community publishing. Key features of the experiment are that it is **open access** (so everyone can benefit from it), **modular** (so users can select what they need and ignore the rest), **dynamic** (so it can be updated), and **collaborative** (so that it can benefit from the wide range of approaches and perspectives of the community). In particular, we invite members of the sustainability science community to collaborate with us through open review and annotation of portions of the evolving **Research Guide** that interest them, through invited commentaries, or through suggestions regarding new sections that should be added to make the Guide more useful.

The structure of the site hosting this experiment allows all readers to see all collaborative contributions and who is responsible for them, to engage with them (e.g., by commenting on others’ comments), and to benefit from them (e.g., by having graduate students discuss the posted comments and criticisms of the main text). We believe this experiment—if supported by the community—could serve several valuable functions. First, it could help to bridge the various island empires of sustainability science through engagement of multiple research programs and perspectives and inclusion of their insights in a dynamically evolving community product. Second, it could serve as a teaching tool that not only synthesizes progress in sustainability science but also highlights for discussion unanswered questions and ongoing debates. Finally, it could help to develop a more equitable community of sustainability science researchers, with its products open to access by all rather than restricted to those able to navigate paywalls and other barriers to the free and open exchange of ideas.
Read:

**Scope of the Research Guide**  
*by William C. Clark and Alicia G. Harley*  
A strategic perspective on the central findings and current challenges of research relevant to sustainable development, focused on work providing generalizable guidance for use in practical problem solving while ignoring disciplinary foundations or specific applications.

**An Integrative Framework for Sustainability Science**  
*by William C. Clark and Alicia G. Harley*  
Highlights the union set of elements and relationships that researchers have shown to be useful in explaining nature–society interactions as a globally interconnected, complex adaptive system in which heterogeneity, nonlinearity, innovation, and power play formative roles.

**Capacity to Measure Sustainable Development**  
*by William C. Clark and Alicia G. Harley*  
Sustainability goals of advancing well-being now and in the future can be tracked by measuring inclusive wealth: the social value of those natural and anthropogenic resources that form the productive base of the Anthropocene System.

**Capacity to Promote Equity**  
*by Alicia G. Harley and William C. Clark*  
Achieving fair or equitable distribution of the fruits of the earth’s resources both within and between generations is a central objective of sustainable development. Accelerating progress requires above all more effective means for empowering those who are now losing out.

**Capacity to Promote Adaptation**  
*by William C. Clark and Alicia G. Harley*  
A system’s adaptive capacity allows it to remain on something like its current development pathway in the face of inevitable shocks. Key determinants include resource endowments, heterogeneity, connections, system hysteresis, and power differentials among actors.

**Capacity to Promote Transformations**  
*by Alicia G. Harley and William C. Clark*  
A system’s transformative capacity allows it to shift out of regimes supporting unsustainable pathways of development and into regimes supporting sustainable ones. Key determinants include the abilities to imagine alternative futures, to innovate, and to disrupt incumbents.

**Capacity to Link Knowledge with Action**  
*by William C. Clark and Alicia G. Harley*  
Knowledge is a potentially valuable asset for pursuing sustainability. But how can we realize that potential? Key findings are that knowledge and society continually reshape one another and that it therefore matters who participates in and shapes the co-production process.

**Capacity for Governance**  
*by Alicia G. Harley and William C. Clark*  
Building and exercising the capacities necessary for sustainable development requires that people work together. The governance arrangements helping them to do so are grappling with the expansion of which actors participate, what tools they use, and how they confront uncertainty.

**Conclusions**  
*by Alicia G. Harley and William C. Clark*  
The long-term evolution of the Anthropocene System cannot be predicted but can be understood and partially guided through dynamic interventions. Six interacting capacities are necessary to support such interventions in guiding development pathways toward sustainability.
Genealogy of this Research Guide


The on-line, open access version of the Research Guide we present here is designed to grow via community input through multiple revised versions of individual sections. The appropriate citation for the Guide as a whole is: Harley, Alicia G., and William C. Clark. (current year). Sustainability Science: A guide for researchers. (1st ed.) https://doi.org/10.21428/f8d85a02.9312c7d2. Available at https://www.sustainabilityscience.org/guide. Citations for the current version of the individual sections of the Guide can always be obtained through the “CITE” button on the home page of that section.