Evaluating Knowledge Products for Sustainability, Resilience, and Climate Change Response Efforts

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Abstract

This research evaluates decision-support tools that are built for decision-making towards sustainability and resilience in the context of climate change. We seek to understand how these tools are applied in different contexts by analyzing six decision-support tools built for ecosystem-based management processes. We collected data, reviewed research studies, and analyzed their methods using the KnoPE (Knowledge Product Evaluation) Framework, a four-dimensional analytical system that organizes elements, assesses scales, assesses alignment to a theory of change, and analyzes the use of a decision-support tool.

Our results help identify opportunities and challenges to creating tools that are easily accessed and understood to make decision-making in the context of climate change easier to achieve. Developers and investors of the decision-making tools are interested in advancing them to expand accessibility and comprehension for the use of policy and decision makers who have the influence to initiate change. Decision makers need support planning for a variety of climate-change impacts and these tools will provide context and information so they can better prepare for the impending future.

Introduction

Policymakers need guidance to plan for the impacts of climate change in a time when unprecedented natural disasters and environmental hazards are rising. Further evaluation of decision-support tools will provide vital, organized information that will support their translation into decision-making processes to make these processes more action-oriented, science-informed, and considerate of a changing climate.

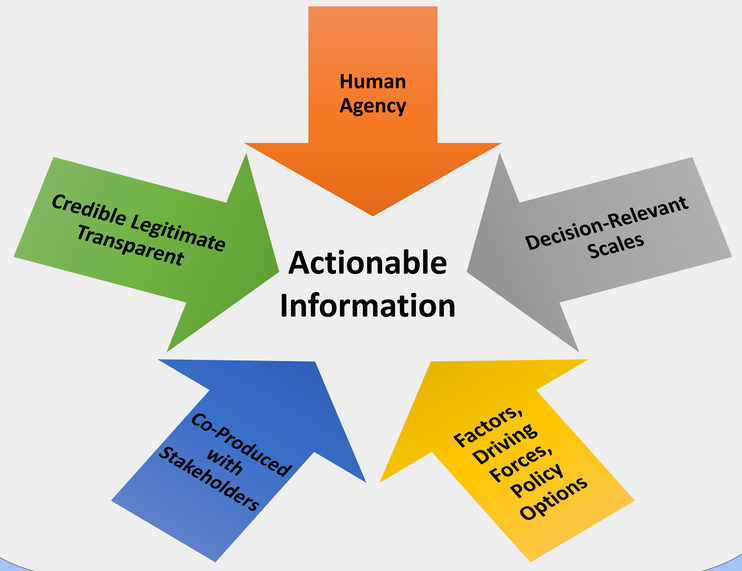
Methods

KnoPE Framework Evaluation:

1. Element overview
2. Scalar assessment
3. Use assessment

*When evaluating each respective case study, components were organized by their appropriate framework dimension and unique characteristics of the tool were noted. Case studies were then cross-analyzed to evaluate similarities across cases and observations unique to a specific knowledge product.

– Element Overview – Organizes basic knowledge system information.	• Typology, Description, Purpose • Risks assessed, Intended uses, Stated value-added, • Development, Implementation, Methods used, Availability
– Scalar Assessment – Analyzes the broadest analytical dimensions within knowledge systems.	• Decision-relevant scales: Spatial, Temporal, Jurisdictional, • Biophysical, Economic, Institutional, Management, Risk, • Ethical, Developmental, Networks, Knowledge
– Use Assessment – Analyzes the outcomes of decision-making processes that use the knowledge system	• Primary and secondary use-cases • Outcomes, value-added, types of actions taken



Results

We surveyed each decision-support tool from the perspective of decision-makers unrelated to the development of the tool to gather information on how they are and might be used in primary and secondary circumstances.

Some trends relevant across all case studies include utilization of interactive web-based decision-support tool modeling software systems, intended focus on ecosystem-based adaptive management that promotes sustainable practices, as well as primary and secondary uses in the long and short-term application of the tool.

Conclusion/Discussion

In conclusion, the cross case study comparison indicated that decision-support (DS) tools deemed to be accessible and usable for the most part. However, they lack an easy-to-follow arrangement of scientific content and application analysis. Combined best practices for adoption and diffusion of DS tools analyzed and organized by the Knowledge Product Evaluation Framework includes the development of DS tools to align better with adaptive and outcome-based management, development of web-based databases to increase accessibility and involvement of stakeholders, and public participants throughout the DS creation process. Like many other advocates for climate change adaptation and mitigation, we would like to promote these tools so that decision-makers are aware of their functionality and applications to the legislative process.

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