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Mini Review on Monitoring and Evaluation in Extensive Agricultural Practices and Large-Scale Challenges

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Abstract

We have applied conceptual modeling to increase communication, understanding and commitment in the project of seven NGOs "Sustainable Regional Development in the Odra Catchment". The main goal was to help our NGO partners to facilitate their efforts related to developing sustainable policies and practices to respond to large-scale challenges (EU accession, global changes in climate and economy) to their natural, economic and socio-cultural heritages. Among the variety of sustainability issues explored by these NGOs, two (extensive agricultural practices and "green" local products) were examined by using Adaptive Management (AM) as a framework that would link analysis, discussion, research, actions and monitoring. Within the AM framework the project coordinators used tools of systems analysis (Mental Model Mapping) to facilitate discussions in which NGO professionals and local stakeholders could graphically diagram and study their understanding of what factors interacted and how they affect the region's sustainability. These discussions produced larger-scale Regional Sustainability Models as well as more detailed sub-models of particular factors, processes, and feedback loops that appear critical to a sustainable future.

Keywords: Conceptual modeling; Barycz Valley; Sustainability indicators

Introduction

One of the main reasons for this is the uncertainty emerging not only from complex interactions within different sectors (for example, academia, government, business), but also from the tangle of relations across ecological, economic and socio-political domains. The challenge to understand and manage complex systems emerges in a history of surprising reversals of initial policy success [1-2]. At first, attempts to eliminate, and then to merely control disturbances (flood, fire, and pests) have often promoted.

Larger and more profound disruptions stubborn resistance to most policy remedies has earned such problems the title of wicked problems [3], as if evil intention is a metaphor for how intractable, unknowable and uncooperative the world is. Blame for rising flood statistics or declining river valley economies cannot simply be pinned on the usual suspects: exogenous drivers or ignorant human actors or policies. Analysis of the underlying complexity continues to improve, but understanding, and more importantly the capacity to adapt, remains woefully behind the evolving reality. The move from the hard and narrow technical approach to a more adaptive and comprehensive soft path [4] requires not so much methods of analysis or management intervention, but their integration.

For thirty years a decision making process has been evolving to address the challenge of learning while managing. This process, Adaptive Environmental Assessment and Management (AEAM), also known as Adaptive Management (AM), offers a framework to integrate research, policy and local practice that has been developed over three decades of experimental applications to understand and manage crises of collapsed fisheries, agriculture, forestry and rangeland grazing increases adaptive capacity by shifting linear decision making processes (crisis - analysis - policy) to a cyclic learning process that iteratively integrates how we modify assessment, policy formulation, implementation and monitoring in order to track and manage change in the world.

Result and Discussion

Monitoring and Evaluation constitutes the link closing the AM cycle. Monitoring is usually done through defining and measuring different indicators. Indicators can be developed in a top-down expert driven way such that a uniform set of indicators is equally measured in different locations involved. Quite often, however, the impact is more academic than practical and does not lead to any meaningful change on the ground but only to comparing the indicators' evolution over time. Alternatively, indicators can also be prepared as a means of facilitating local communities' learning about sustainable development [5-6]. This approach usually requires public or stakeholder participation in creating and using the indicator database [7-8]. The level of participation can vary – from manipulative, wherein it is only pretence and the local stakeholders have no influence on the decision process, to self-mobilization, wherein local people initiate actions themselves. In the latter case, when people design and monitor their own indicators, they develop a better common trust and experience with which to interact with professionals and higher authorities [9-10]. However benignly intended, the interference of "expert" external agencies can stifle the development of trust and cripple the long-term acceptance and implementation of innovative policies.

The Barycz River, with a total length of 133 km, is one of the largest tributaries of the Odra River, which in turn is the second largest river in Poland. A basin topography that combines a flat lower valley with steep slopes in the surrounding hills results in diversified habitats with a mixture of forests, meadows and ponds, which occur both in the form of large and small complexes. The total river valley covers an area of 2600 km^2 and it is administratively divided among 17 local

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communities' municipalities [11-13]. The hydrological system supports Europe's biggest fishponds – the Milicz Ponds. Large migratory flocks of birds concentrate seasonally in the whole Barycz Valley. As many as 276 bird species (166 breeding) have been recorded in this area.

Conclusion

Systems methods help people see what they normally do not consciously think about or discuss in an open forum: feedback loops with complex interactions and delays that create long and medium-term impacts. The transition to sustainability requires that stakeholders grasp the structure of systems. These methods help in that transition by exposing counter-intuitive links between natural, economic and social processes and by showing how delays distort our understanding of change. Stakeholders in the Barycz Valley approached by the NGOs directly participating in the project, as well as the NGO representatives, found these methods and ideas powerful in opening new ways to capture values, qualities and relationships related to the sustainability of their community and environment. They also felt that systems science methods were good complements to traditional verbal descriptions of sustainability. Briefly, stakeholder-driven processes that use graphical maps of sustainability engage a far wider group and build broader acceptance of novel ideas than do words alone. Professionals in local NGOs are good contributors to the start of a discussion within the Adaptive Management Framework, helping initially to absorb new ideas and methods, and subsequently to act as bridges of understanding to local stakeholders with whom they have established trust over the years. Once an Adaptive Management Framework has established an open, trusting exploration of ideas among such professionals, the discussion can much more easily be extended to include (and be challenged to improve by) the experience of the wider community of concerned citizens.

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Conflict of Interest

None.

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