Non-knowledge management in nature conservation, a new approach for a systemic risk spotting and evaluation
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ABSTRACT: Despite the complexity-induced and future-related uncertainties, and the inherent lack of scientific evidence that would allow the accurate prediction of change, important decisions about biodiversity conservation continue to be made at policy and operational levels. Climate change alone presents a major risk to ecosystems, and yet adequate non-knowledge and risk avoidance strategies for managing change over time does not feature in conservation management plans. In an attempt to address these fundamental issues, a new method for vulnerability and risk management at conservation sites (MARISCO) is proposed that is based on the adaptive management approach Open Standards for the Practice of Conservation. A comprehensive classification system of potential risk factors is incorporated into the process followed by a systematic evaluation of possible impacts using measures for levels of knowledge, dynamics, manageability, system activity and spatial analysis of risks. From this analysis a better understanding of the current situation results in that future studies indicate that the method generates a wide range of scenarios and strategies for risk management. It also takes account of human-causation factors such as poor understanding and interpretation of knowledge, non-knowledge decisions, and lack of documented evidence.

INTRODUCTION

• Nature conservation management often faces very high complexity which is inherent not only in biophysical systems itself, but also in the social systems that generate impacts, disturbances and risks (Ibisch, 2012).

• Rapid change as climate change accelerate this increasing complexity

• The challenge is to consider characteristics of complex systems in a situation analysis and strategic planning for nature conservation: e.g. hidden (non-transparent) elements and relations in a running system, delay in reaction, swinging behaviour, non-linear development, -> worst - and best case scenarios should be included

• But there seems to be a certain cognitive weakness in terms of overviewing complex systems (Dörner 2011). In addition, humans in certain situations tend to willingly ignore knowledge that disturbs existing world views and optimistic plans (Shard et al. 2011). We are not moulded to head for accuracy, instead, we muddle through our lives fast and in a way as simple as possible. Intuitively, we do not think in world views and optimistic plans (Dörner et al. 2011). We are not moulded to head for accuracy, instead, we muddle through our lives fast and in a way as simple as possible. Intuitively, we do not think in complex algorithms, we rather think in a pragmatic and heuristic way (Frey 2011, Gigerenzer & Brighton 2009).

• An extension to an existing adaptive conservation approach is presented in order to tackle these human cognitive weaknesses to actively and explicitly address needs related to risk and vulnerability management (Fig. 1)

• Adaptive Management is one approach which is used to tackle the corresponding problems).

METHOD

MARISCO Method (Mapeo Adaptativo de Riesgo y vulnerabilidad en Sitios de COservation – Adaptive Management of Risk and vulnerability at Conservation sites) based on the Open Standards for the Practice of Conservation, which are a prominent and well-tested approach to adaptive management. Through a clearly defined taxonomy an common understanding is developed in order to make planning comparable, coherent and most of all learn from each other. A constant revision of the planning process and shall lead to adaptation or even the eradication of the encountered failures (CMP 2007).

The main features

• Consideration of multi-stakeholder groups and their relevant perspectives for the analysis and planning

• Definition of the conservation targets, with regard to biodiversity and human well-being.

• Identification and assessment of current and future threats (risks) and stresses affecting the targets, underlying processes (e.g., criticality, dynamics, manageability).

• Illustration of the systemic cause – effects principles in a conceptual model that also identifies major groups of relevant factors.

• Spatialization of identified factors in order to complete the systemic analysis by incorporating unseen factors and relations

• Identification and prioritization of vulnerability-decreasing and low-risk strategies and incorporation of these into existing management plans.

Outlook

• As adaptive methodologies must evolve themselves, the following aspects are considered for improvements and will be tested in upcoming workshops: an risk – classification for selection, factor with attached information on their impact intensity on a indicator level to document change over time. A threat and factor monitoring, which would complement existing approaches to target and goal monitoring.

• Furthermore a MANUAL will be published funded by the German Agency for International Cooperation (GIZ).

• A Plug-In software solution is discussed with the Open Standards developers.

References:


OUTCOME and CONCLUSION

The MARISCO approach proved to be a suitable systemic risk analysis tool.

The great potential of MARISCO lays in its holistic and systemic approach. At the same time, its participatory character gives stakeholders the opportunity to state their experiences and concerns and enables them to be involved in decision-making, thus increasing acceptance for agreements and resulting policies. MARISCO is adaptable to different workshop and project settings, and does not rely on specific types or amounts of data, but utilizes different forms of available data. Furthermore, it not only refers to ecological risk but also includes other factors influencing the management plans, such as socio-economic factors (e.g. population growth) in an integrated approach. A specialty of MARISCO is a dynamic analysis of threats and contributing factors also comprising plausible future trends and risks (Fig. 3).

MARISCO was applied successfully in various countries and in different cultural contexts as Asia, Latin-America and (East) Europe. It provides an approach for actively including and managing given non-knowledge in the analysis and planning for nature conservation management.

Fig. 1: Conceptual model of faulty decision-making (labels: indicate where Open Standards and MARISCO methods tackle the corresponding problems).

Fig. 2: Adaptive risk and vulnerability management at conservation sites: methodological steps of MARISCO derived from the Open Standards for the Practice of Conservation.

Fig. 3: A simplified conceptual model for Lacandon National Park in Guatemala. Red arrows signify reinforcing feedback-loops in the system.