

Breaking Down...

SCIENTIFIC PAPERS

Scientific papers can be really dense and hard to understand, particularly if you don't know all of the terminologies the authors use. Language is a huge part of making science accessible, and we've put together a quick guide to help you.

▼ WHAT'S IN A PAPER

Abstract

To get an overall summary and idea of **what** was done, **why** it was done, and **what** was found.



Introduction

This will give you some background information and more information on the goals and aims of the research.

Discussion

This will give you a more detailed summary of the results, and provide reasons for the conclusions based on these results.



Results

The figures and tables will provide the data in a ways-to-view format.

▼ DEFINITIONS



Open Access:

Papers that are published as **open access** are free to view, download, and read, without paywalls. Anyone with internet access can use Open Access resources.

Peer Reviewed:

Before a scientific research paper can be published, it is reviewed and edited by other experts in the same field. This is done to ensure that the papers are high quality and well written. The peer review process is not perfect, and very costly.



Initial Reading

If you have the time, the best way to read through a paper and make notes on it is to **not make notes** on it the first time you read through! This might sound counter-intuitive but reading through something quickly is a really good way to find:

- the structure
- the key arguments
- new terms or theories

Community-based conservation in a globalized world

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Abstract

Communities have an important role to play in biodiversity conservation. However, community-based conservation as a panacea, like government-based conservation as a panacea, ignores the necessity of managing commons at multiple levels, with vertical and horizontal interplay among institutions. The study of conservation in a multilevel world can serve to inform an interdisciplinary science of conservation, consistent with the Convention on Biological Diversity, to establish partnerships and link biological conservation objectives with local development objectives. Improving the integration of conservation and development requires rethinking conservation by using a complexity perspective and the ability to deal with multiple objectives, use of partnerships and deliberative processes, and learning from commons research to develop diagnostic tools. Perceived this way, community-based conservation has a role to play in a broad pluralistic approach to biodiversity protection: it is governance that starts from the ground up and involves networks and linkages across various levels of organization. The shift of attention to processes at multiple levels fundamentally alters the way in which the governance of conservation development may be conceived and developed, using diagnostics within a pluralistic framework rather than a blueprint approach.

commons | complexity | governance | institutions | sustainability

Keywords

If the ecosystems that support biodiversity were simple systems, and if the creation and implementation of protected areas did not involve social and political controversy (7), state control would be an appropriate low-cost solution. But this is not the case. Conservation is typically a complex systems problem, because the natural environment itself is a complex adaptive system with issues of uncertainty, and multiple stability domains (8). Ecological systems are hierarchically organized, with each subsystem nested as a subsystem. Complexity theory teaches that the levels are interconnected, but that each level requires diverse concepts and principles. Self-organization provides a unifying principle for complex adaptive systems: "The specifics are in the often simple rules that govern how the system changes in response to past and present conditions, rather than in some goal-seeking behavior" (ref. 9, p. 12).

The social systems involved in conservation also are multilevel, with institutions at various levels of organization from local to international. Processes at these levels require different but overlapping sets of concepts and principles, an idea reflected in the commons literature (10, 11). Because each level of a scale is different, the perspective from each level is likely also different. The global lens of biodiversity conservation (that it is a global commons) is different from the local lens on biodiversity (local livelihoods). This difference does not mean one is right and the other wrong; it means they can both be different points of view. Pluralism in perspectives is mirrored in pluralism in knowledge. In conservation disputes, local knowledge may often appear at odds with science. But in many cases, the differences in knowledge and understanding of a resource system have to do with differences in the level at which information is obtained (12), a point often missed in blueprint approaches.

Insights from the path-dependency concept in complex systems further reveal the inadequacy of the blueprint approach. As may be applied to social sciences, this is the argument that context (history, politics, and culture) is important in understanding a particular case. This is not to say that changing direction is impossible; rules and practices change all the time through adaptation and learning, and changing directions or reversing a path may be possible. The point is that each case is conditioned by its context, developed, meaning a solution package developed for one case is not readily transferred to others (13, 14).

For example, the community-based marine protected-area approach, developed in one area of the Philippines and replicated throughout the country with little attention to context, resulted in a high rate of failure (15). However, with attention to context, it should be possible to transfer lessons, insofar as similar diagnoses call for similar treatments.

In sum, the perspective of biodiversity conservation and the relevant social-ecological system as complex and multilevel is in sharp contrast with the simple view of biodiversity conservation that has led to blueprint solutions. When we shift away from the panacea

New terms

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Abbreviations: EI, Equator Initiative; ICDP, integrated conservation and development project; NGO, nongovernment organization; UNDP, United Nations Development Programme.

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Introduction

Biodiversity conservation is an activity for which a number of panaceas, blueprint approaches, have been widely promoted. Over the past century, conservation has largely relied on national parks controlled by central governments, a model adopted by much of the world as the main, if not the only, way to carry out conservation. Is the national level the only one at which conservation measures can be taken? Some scholars have emphasized the importance of biodiversity conservation at the global level and have suggested that solutions need to be imposed by international agencies. Others have emphasized community-based conservation and yet others, the privatization of conservation areas. There has been much debate on the merits of these various solutions but little discussion of pluralistic approaches, such as the distribution of authority across multiple institutions (1) or considerations of ways to use institutional diversity in general (2). This omission is not due to a lack of theory. Much of the relevant material is in the commons literature (3).

Biodiversity conservation can be treated as a commons problem, specifically as a multilevel commons problem. Biodiversity is a global commons important for humanity as a whole, a regional commons important for ecotourism and other benefits, and a local commons that produces ecosystem services for human well-being at the community level (4). As a multilevel commons, the ownership and control of biodiversity are complex. Some biodiversity is under state ownership, some is under the control of communities, and some is privately owned. Many of the lands that support biodiversity are under multiple and competing claims, including nominally government-owned forests under community control (5); protected areas designed for biodiversity conservation but that allow for human use, as with the World Conservation Union's protected-area categories V and VI (www.unep-wcmc.org/protected_areas/categories/index.html); and locally maintained traditional protected areas, such as the sacred groves of Kerala, India, which can be as effective as nearby government protected areas (6).

▼ READING A PAPER

The DISCUSSION forms the main part of the paper.

Diagrams

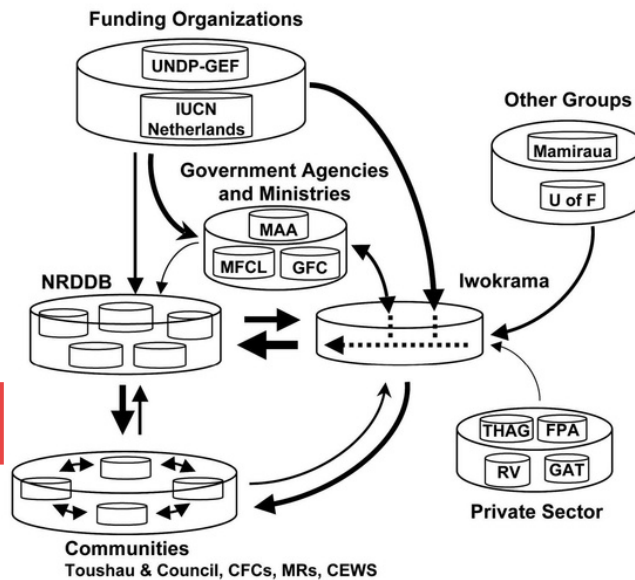


Fig. 1. Key institutional linkages facilitating the activities of the *Arapaima* conservation project, Guyana. Arrows show information and financial flows; thicker lines indicate stronger interactions. [Reproduced with permission from ref. 16 (Copyright 2004, University of Manitoba).] The figure was prepared by Damian Fernandes (Natural Resources Institute, University of Manitoba, Winnipeg, MB, Canada).

eight principles tend to characterize sustainable commons, as opposed to unsustainable ones. See also the detailed set of critical enabling conditions for commons sustainability by Agrawal (41). Ostrom (2) provides a broad diagnostic approach to dealing with these variables that is complementary to the list of questions in Table 2. Especially important here for the multilevel world are questions with regard to linking and networking (33), political economy and power relations in these partnerships (39), and the effectiveness of NGOs and other groups that have a role in bridging scales (35).

The first set of questions in Table 2 helps to take stock of the status of the commons and commons institutions in the area of the conservation-development project. For effective community-based conservation, the project needs to do something more: find strategies to strengthen existing commons institutions; build linkages horizontally and vertically; engage in capacity building, trust building, and mutual learning; and invest sufficient time and resources to achieve these objectives (Table 2). Linkages seem to be crucial for conservation-development project success. Our preliminary results from the UNDP EI cases indicate that successful projects tend to have not only rich networks of support involving more than a dozen partners but also links across four or five levels of organization (Table 1).

The structure of the linkages in the Guyana case, one of the simpler cases in the sample of UNDP EI projects, is sketched in Fig. 1. The linkages cross four organizational levels: the community; the regional level involving the North Rupununi District Development Board, a regional NGO representing the communities, and its key partner, Iwokrama; national government agencies; and the international level involving donor organizations. Different groups bring different inputs for the conservation of *Arapaima*. For example, a Brazilian group, Mamirauá Institute for Sustainable Development, which had experience in *Arapaima* conservation, shared its exper-

tise in community-based monitoring of *Arapaima* and provided technical training for fishers through Iwokrama.

The multiple linkages, the ever-changing mix of partnerships and needs, and the fact that no two UNDP EI projects had identical sets of relationships add up to a complexity that cannot be addressed through set prescriptions. Consistent with the idea of path dependency, projects evolve in different directions, with different linkages and partnerships and different strengths and needs. As such, any blueprint approach is likely to be inadequate, thus the need for a diagnostic approach (2).

Conclusions

There is agreement in the Convention on Biological Diversity in the findings of such global studies as the Millennium Ecosystem Assessment (32) and *World Resources 2005* (18) that ecosystem management and human well-being should be integrated, recognizing that biodiversity conservation and livelihood needs are ultimately complementary goals. This integration requires building the capacity to deal with multiple objectives, the use of deliberative processes, learning from commons research, and, in general, developing a complexity approach for commons governance.

In the context of panaceas (2), the complexity approach highlights how simplistic the blueprint approach has been, and how meaningless, given that the "correct" governance mechanism depends on the level at which one chooses to examine the social-ecological system. The panacea of community-based conservation is probably no more effective than the panacea of exclusively state-based conservation, because they both ignore the multilevel nature of linkages and multiple partners required for any biodiversity conservation project to be successful. Such an analysis would suggest that conservation cannot be conceived and implemented only at one level, because community institutions are only one layer in a multilevel world. Thus the debate over community-based

Conclusion

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Re-Reading

After you've read the paper and looked up new terms, grab your notebook and go back through it. It takes a while to find your favourite note-taking technique, but we've got some tips to help you start!

▼ READING A PAPER

Making Notes

One of the most difficult things about reading papers is taking notes. It's easy to highlight everything, to use really long quotes from the authors, and to describe what the authors say rather than analyse it. [Dr Raul Pacheco-Vega's blog](#) and social media are a great starting point to see someone who spends their life taking notes!

Some people love **colour-coding**, but other people find **just writing** notes is ideal. Some people have to write everything by hand in **notebooks** to help them remember, and other people are happy making notes on their **computer**. Some people print everything off so that they can **highlight** papers and **scribble** notes in the margins, and other people prefer keeping the papers **virtual** and the notes separate. **The bottom line is: if your notes help you understand the content, then they're good notes.**

Abstract

Introduction

Conclusion

A good starting point is to read the **AIC** in a paper (the abstract, the introduction, and the conclusion).

The **abstract** will give an **overview** of what the paper addresses, but is limited by space. Most abstracts can only be 100-150 words, which means important details might be missed out!

The **introduction** will tell you what the paper is **about**. Authors often include a summary of the paper and how their research fits in with (or challenges) other research.

The **conclusion** will have a **summary** of what was done and how it was done, including what **impact** the results of the research/experiment might have.

