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Stepping Out of Our Paradigm: A Path for the Integration of Scientific and Traditional Ecological Knowledge in Natural Resource Management

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Abstract

The call for the integration of scientific and traditional ecological knowledge (TEK) in natural resource and environment management (NREM) is now stronger than ever. Australian central and state governments have indicated that “knowledge integration” in NREM is a way to pursue social equity and enhance sustainability. Yet a clear path for integrating knowledge systems on the ground is still to be developed, which often hinders the dialogue between holders of different knowledge systems. In this paper we argue that the integration of knowledge systems in NREM should be pursued at the level of the knowledge production process and with the involvement of knowledge holders. We are aware that integrating TEK and scientific knowledge requires a change of social values. To achieve this change, we argue that both scientific and traditional ecological knowledge holders need to step out of their own paradigms and meet each other half way.

Keywords

knowledge integration, traditional ecological knowledge, co-management, indigenous values, validation, freshwater

Introduction

The value of traditional ecological knowledge (TEK) as a source of natural resource and environmental management (NREM) practices is widely acknowledged. Extensive evidence has shown the effectiveness of TEK in monitoring complex ecological processes (Chalmers & Fabricius, 2007), in adding knowledge to scientific knowledge systems (Johannes, Freeman & Hamilton, 2000; Moller, Berkes, Lyver & Kislalioglu, 2004) and in providing adaptive approaches to the management of complex social-ecological systems (Mazzocchi, 2006). In summary, TEK can enrich the Western approach to NREM, historically based on the domination of ecosystems, with an emphasis on steady states and predictable yields which often cause the loss of resilience of social-ecological systems (Berkes, Colding & Folke, 2000). In addition TEK can support many environmentally based livelihoods, which represent a potential source of income for indigenous communities, as observed in Australia (Altman, 2004).

The Australian National Government supports a policy of integrating indigenous and non-indigenous values and knowledge in NREM. Many strategic documents promote this integration: examples are the National Strategy for the Conservation of Australia's Biological Diversity and the National Water Initiative. At the local level, however, environmental managers need to engage with many local stakeholders, including indigenous people, to implement integration policies based on NREM plans that address the perspectives of indigenous Australians. Central governments, however, have not provided local NREM managers with a clear path for integrating indigenous and scientific knowledge in NREM (McDonald, Weston & Dorrington, 2003).

Elsewhere we have argued that the adoption of knowledge integration frameworks by local NREM agencies would provide such a path for integration (Gratani, Royee, Butler, Valentine, Burrows & Canendo, in press). In this paper we advocate that parties involved in the process should each “step out of their own paradigm” to facilitate knowledge integration.

Our Case Study

In 2009 we conducted a case study with the Malanbarra Yidinji community in the Wet Tropics of Queensland. These are the “people of the stony river bed” (Nungabana, 1996). The community has a traditional dependence on, and cultural knowledge of, the Wet Tropics rainforest and the resources of the Mulgrave River. As traditional owners, they are involved in the co-management of the World Heritage Area surrounding the river, but are not satisfied with their role. They perceive that decisions made by Queensland and Australian Government agencies responsible for NREM, based on Western scientific paradigms, are disconnected from their aspirations and do not respect their cultural values or TEK.

The case study with the Malanbarra Yidinji community aimed to help answer the question: “How can we combine indigenous and scientific knowledge in NREM?”. Within this question, we focus mainly on how scientific validation of TEK could promote its application in NREM (Gratani et al., in press).

In developing our case study, we focused on an environmental problem present in the study area such as the invasion of a type of freshwater fish, the tilapia. Some Malanbarra Yidinji elders, with knowledge of poisonous plants that could affect tilapias, were available to test the plants on the fish in a scientific laboratory experiment. We developed a research plan to test the hypothesis that poisonous plants—prepared and applied according to TEK—were effective on tilapia, set within a co-research framework established for the region (Cullen, Butler, Hill & Margules, 2008). Western scientists involved in the research were sceptics because of their education—thus insistence on scientific evidence to support a hypothesis—and because they knew that the tilapia was a very tough fish. The experiment provided scientific evidence that plants applied in the traditional way—fresh and ground—affect tilapias. During the conduct of the case study we noticed that once the TEK-based notion that poisonous plants can affect tilapias was translated in quantitative scientific terms through the scientific experiment, it was more easily understood and accepted by Western scientists. The conclusion we drew from the case study is that the laboratory experiment (Gratani, Royee, Butler, Valentine & Burrows, in review) facilitated knowledge transfer from indigenous elders to the scientific community. While doing so, it also provided an insight into the knowledge transfer process that led to the development of a framework for collaborative validation of knowledge (Gratani et al., in press). We believe that the adoption of such framework would facilitate knowledge integration in NREM.

Our idea is that collaborative validation provides the opportunity, for all parties involved, to achieve the production of new/validated knowledge by addressing different steps involved in the production of knowledge. Such new/validated knowledge can then be applied in NREM.

Our case study confirmed that there is a limit to the integration of knowledge systems: only knowledge that is shared, understood, contextualised, valued and formally retained, persists in both indigenous and non-indigenous knowledge systems and, as such, can be considered “integrated knowledge”. To maximise the production of integrated knowledge we need to act on each of these five steps of the integration process. We discussed elsewhere how to optimise the comprehension, contextualisation and evaluation of knowledge coming from a different domain (Gratani et al., in press). We hereby want to underline how, for the integration process to succeed, each party involved needs to step out of its paradigm (Figure 1) and be willing to experiment with a different collaborative knowledge production process (Mazzocchi, 2006).

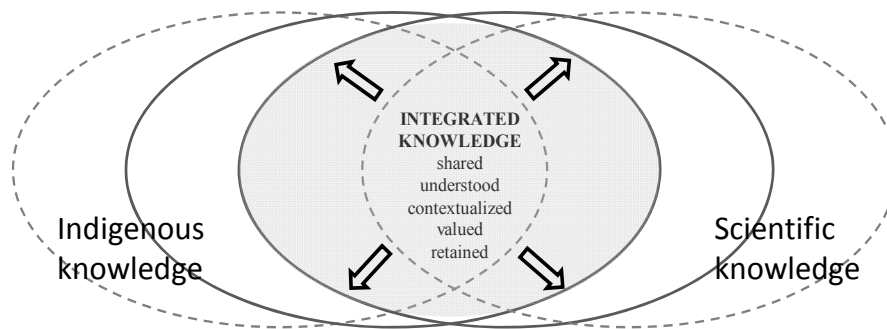


Fig.1. The diagram illustrated that when holders of scientific and traditional knowledge are firm on their initial positions the integrated knowledge produced is limited. To maximize it (arrows) the holders of the two knowledge systems need to step out of their own paradigm and meet half way.

Stepping Out of Our Paradigm: The Need to Value Each Other's Knowledge Systems

When knowledge has been shared and made intelligible to everyone, all parties involved need to contextualise it and value it. In the steps of contextualisation and valuation the information needs to be fitted into a framework of pre-existing knowledge and values in order to be accepted (Gratani et al., in press). If the information is in conflict with the pre-existing framework, it is rejected (Diemers, 1999) and the process of knowledge integration fails in its very first phase. The contextualisation of the information is the step of the integration process where the parties involved need to step out of their own knowledge paradigm to allow integration of knowledge to proceed. During the contextualisation, the parties involved need therefore to:

- acknowledge that their own knowledge system is *only one* of the multiple existing visions of the world;
- keep in mind the contribution that other civilisations make to the understanding of nature; and
- widen their pre-existing framework of knowledge and values, to embrace the point of view of other cultures involved in the “production of integrated knowledge”.

Stepping out of our own knowledge paradigm may imply that holders of scientific knowledge must let go of some of the strict rules we have set for ourselves to make evidence acceptable (Mackinson & Nottestad, 1998), that holders of TEK recognise that Western scientific knowledge systems has values worthy of sharing, and that both abandon arrogant attitudes towards their particular knowledge system (Moller et al., 2009). The process may be difficult and even painful, but if embraced, it can enable the innovative learning needed to achieve knowledge integration.

Glossary

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| tilapia | common name for many different species of high protein, freshwater fish in the Chichlidae family |
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