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Red lists in conservation science-policy interfaces: A case study from Vietnam

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ABSTRACT

Red lists of threatened species have been a powerful instrument to interact loss of biodiversity in many countries. However, there have been growing concerns over the scientific basis of red lists and the influence of red lists on conservation policy formulation. This article explores science–policy interface in the development and use of the Vietnamese Red Data Book 2007 by applying the Research – Integration – Utilization (RIU) model of scientific knowledge transfer. Our study has shown the scientific weaknesses of the Vietnamese Red Data Book 2007, which arise from limited availability of updated data on rare and threatened species in Vietnam and unknown factors influencing them. Despite the existing limitations, the science-based policy advice of the Vietnamese Red Data Book 2007 has achieved certain political influence due to successful integration. Our study also reveals that good and actor-relevant communication could help to win powerful allies in conservation policy formulation, which contributes to a successful transfer of scientific knowledge. Based on our results, we recommend that the improvement of the scientific basis of the red lists is essential to enhance science-based policy support in biodiversity conservation.

1. Introduction

Red lists of threatened species have been widely recognized as an increasingly powerful tool for conservation planning, management and policymaking in the field of biodiversity conservation (Cassini, 2011; Lamoreux et al., 2003; Mace et al., 2008; Rodrigues et al., 2006). The International Union for Conservation of Nature (IUCN) has been periodically assessing the global threat status of species and publishing the results in IUCN red lists of threatened species for more than five decades. However, given that the loss of species, as well as most conservation efforts, take place at the national scale, numerous countries have established national lists of threatened species, often based on IUCN red list criteria and guidelines at regional levels (Collen et al., 2013; Rossi et al., 2016; Zamin et al., 2010). Most national red lists are considered as an appropriate basis for setting conservation priorities, while in some countries red lists also have legal status (Keller and Bollmann, 2004). Although the red lists of threatened species have been considered as a valuable tool for conservation (Lamoreux et al., 2003; Rodrigues et al., 2006), the scientific basis of these lists has been debated (Cardoso et al., 2012; Collen et al., 2016; Hayward, 2009; Igor et al., 2017; Vignoli et al., 2017).

At the global level, there is an urgent call to improve the accuracy and scientific credibility of IUCN red list categories since the real risks of extinction for some species have been claimed to be exaggerated against these IUCN categories and criteria (Godfrey and Godley, 2008; Webb, 2008). It is also argued that using red lists as the only tool for setting resource allocation priorities and favoring threatened species over “data deficient” forms may lead researchers to “inflate” the lists (Pimenta et al., 2005). At national levels, red lists have been proved to be underestimated due to the deficit of information used in their assessment, for example, in the case of the red list of amphibians in Italy (Vignoli et al., 2017). In addition, a biased classification for some taxa was also found in an assessment of 135 rare or threatened vascular plant species from southeast Australia (Keith et al., 2000). Thus, there is an increasing need to better understand the scientific basis of red lists and the influence of science on the red listing.

An important role of red lists is to provide scientific policy advice which serves as an interface between science and politics, the so-called “science–policy interface” (Hulme, 2009) in the conservation of biodiversity. Scientific research and science-policy interface have become an increasingly important issue for addressing challenges of biodiversity conservation (Chapason and van den Hove, 2009; Koetz et al., 2012;

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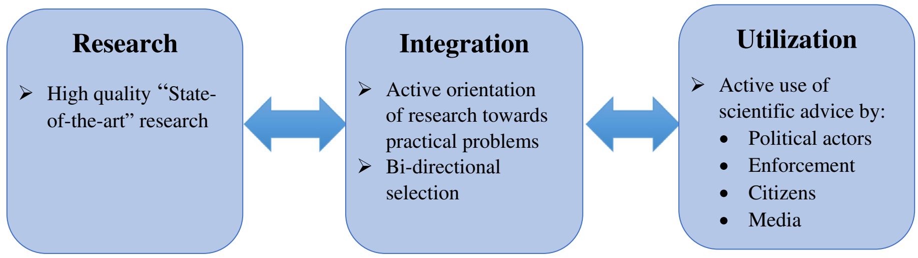

Fig. 1. The RIU model of scientific knowledge transfer.
(Adapted from Böcher and Krott (2016).)

Spierenburg, 2012; Young et al., 2014). Science is expected to provide scientific recommendations that will facilitate decision–making and a rational management of nature (Jørstad and Skogen, 2010). Some studies have shown that biodiversity conservation policies are most effective when based on current scientific knowledge and public verification (Babbitt, 1995; Eisner et al., 1995). Red listing is the process of assigning species to a category of threat representing their risk of extinction (Milner-Gulland et al., 2006). It is claimed that red lists function as a linkage between experts and policymakers where the reliability of red lists as a scientific assessment and the credibility of specific policy based on such scientific assessment are mutually strengthened (Gustafsson and Lidskog, 2013). However, while most studies about the topic of red lists had a natural science perspective (Eaton et al., 2005; Newton and Oldfield, 2008), few published studies have been carried out on the relationship between science and policy in red lists and its influence on conservation policy formulation within specific political context at the national level.

This paper presents findings from a study about the science–policy interface of Vietnamese Red Data Book 2007 by applying a new model of scientific knowledge transfer (RIU model). The RIU model was developed based on research that addressed scientific knowledge transfer for environmental and forest policy in Germany (Böcher and Krott, 2014; Böcher, 2016; Heim and Böcher, 2016) and Eastern Europe (Stevanov et al., 2013). It has also been applied to case studies of scientific knowledge transfer in other countries in Asia (Nagasaka et al., 2016; Dharmawan et al., 2016, 2017; Do Thi et al., 2017a, 2017b). The RIU model has been proved to be useful for analyzing dynamic interactions between science and policy (Nagasaka et al., 2016) and interconnected steps for science-based policy advice (Böcher, 2016). In this study, the RIU model is used as an analytical framework to demonstrate the activities of research, integration, and utilization of the Vietnamese Red Data Book 2007 to reveal its scientific basis and dynamic interactions between science and policy. Our guiding research questions are:

1/ What is the scientific basis of Vietnamese Red Data Book 2007?
2/ How was science-based policy advice of the red data book integrated into national conservation policymaking?
3/ Which role does the red data book play in the science-policy interface in Vietnamese conservation policy?

This paper begins by describing the RIU model that serves as our analytical framework and, subsequently, explains the research methods. Next, the paper elaborates on a case study of the Vietnamese Red Data Book 2007 to demonstrate the relationship between research, integration, and utilization. Finally, based on the research results, the paper presents conclusions regarding potential improvements for science-based policy advice of the Vietnamese Red Data Book to enhance biodiversity conservation in Vietnam.

2. Theoretical framework: science–policy Interface in biodiversity conservation

In the field of biodiversity conservation, people and institutions are becoming increasingly aware of the importance of scientific knowledge and knowledge transfer at the science–policy interface to address the challenge of biodiversity loss (Neßhöver et al., 2013; Spierenburg, 2012; Young et al., 2014). Often, a linear knowledge transfer process is expected, in which science provides knowledge and information about the impact of certain choices, and policy-makers use this information to design policies (Spierenburg, 2012). However, such linear scientific knowledge transfer is rare because it cannot directly function within different underlying rationalities of science (the search for truth) and politics (the search for power) (Böcher and Krott, 2014; Krott, 2012; Miller, 2009). Science–policy interfaces are expected to go beyond the linear model of scientific policy advice through creating space for the exchange and dialogue between 'policy' and 'knowledge' (Görg et al., 2016). However, there have been many challenges related to improving science-policy interactions in biodiversity conservation, which derive from the complexities of biodiversity, as well as from the policymaking process itself (Spierenburg, 2012).

To contribute to the literature about the science-policy interface in biodiversity conservation, we have applied a new model of scientific knowledge transfer (the RIU model) to analyze science-policy interactions of the Vietnamese Red Data Book 2007. The RIU model predominantly follows the idea that policies are the result of co-production between scientific arguments and political reasoning. In the RIU model, knowledge transfer process is defined as a connection of three spheres: Research (R), Integration (I), and Utilization (U), each of which follows an individual logic (Böcher and Krott, 2014, 2016) (Fig. 1).

In the RIU model, scientific results are formulated by scientists using scientific methods and standards from the research sphere (Stevanov et al., 2013; Böcher and Krott, 2014, 2016). Then, scientific results are led to the integration sphere for the selection of scientific knowledge. In integration, stakeholders select research results which are relevant to solve practical problems using criteria based on practical demands (Böcher and Krott, 2014, 2016). On the contrary, practical demands for scientific solutions are interpreted to formulate scientific research questions addressing those practical questions (Böcher and Krott, 2016). The RIU model emphasizes an important bi-directional, non-linear process of switching between research and integration activities to create scientific policy advisory products (Böcher and Krott, 2016; Böcher, 2016). Integration leads to utilization of scientific results by political and practical stakeholders in practice.

The RIU model also emphasizes the importance of quality of scientific expertise in successful knowledge transfer, which has been reflected in many previous studies (Lentsch and Weingart, 2011). Since the quality of scientific expertise is crucial for becoming credible among politicians and practitioners and since it supports the use of scientific knowledge in application contexts (Pregernig and Böcher, 2012), high - quality research must be regarded as an important precondition for successful transfer of scientific knowledge from science to policymaking (Lentsch and Weingart, 2011). However, political actors follow their self-interests, which do not necessarily include the maximal, or even any, use of science (Braun and Benninghoff, 2003). The use of scientific expertise is by no means dependent only on scientific quality, but also on its usefulness for various political actors (Miller, 2009). In the

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