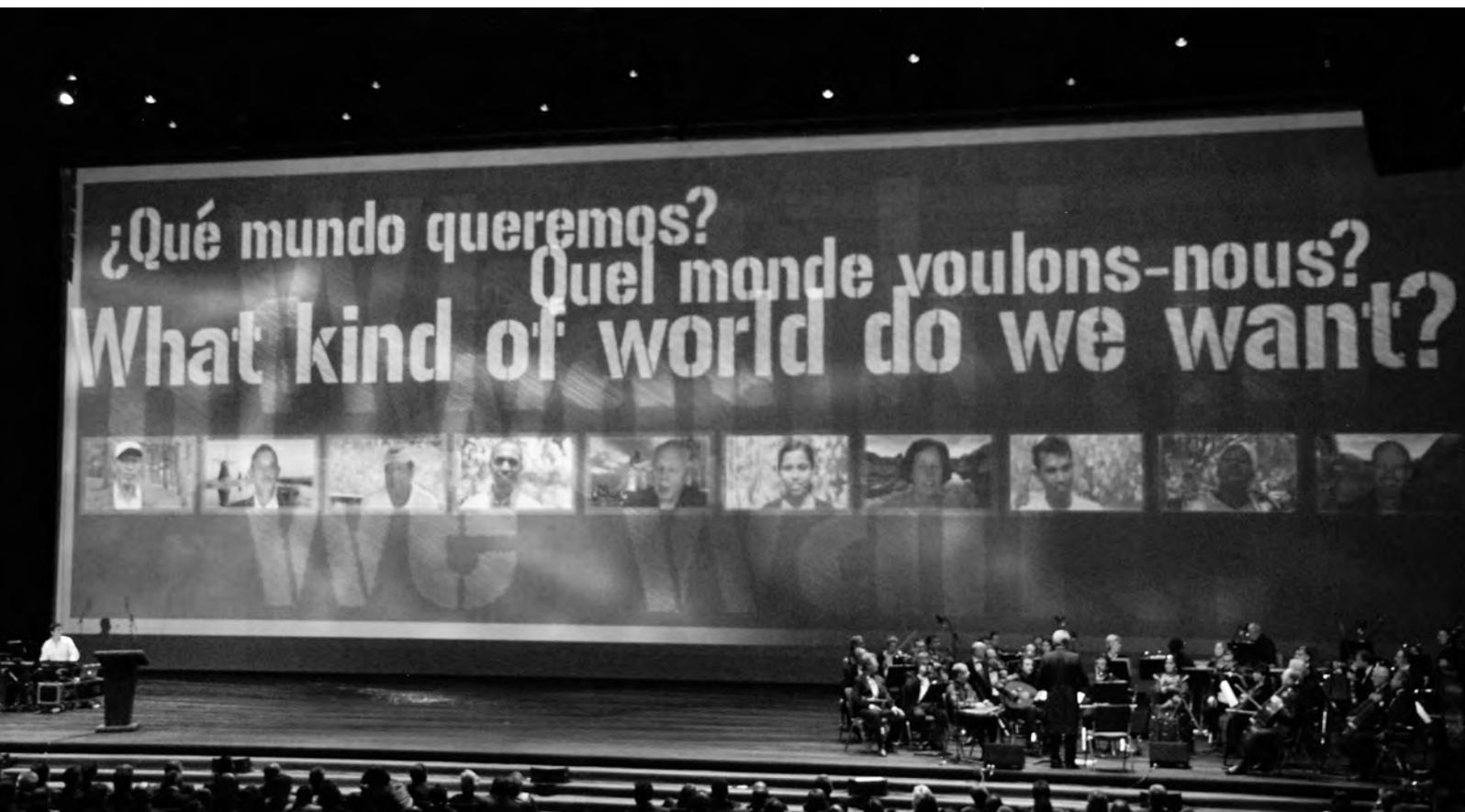


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Setting the Stage for New Global Knowledge: Science, Economics, and Indigenous Knowledge in 'The Economics of Ecosystems and Biodiversity' at the Fourth World Conservation Congress

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Abstract

Global environmental knowledge underwrites the authority of international institutions charged with managing climate change, biodiversity loss and other looming environmental problems. While numerous studies show how global knowledge gains authority at a macro-scale, few examine the everyday practices that establish authority in concrete settings. Investigating such day-to-day practices is important because concrete institutional settings may offer opportunities for resisting, affirming, or transforming global environmental knowledge and the policies it supports. As part of an 'event ethnography' conducted at the International Union for Conservation of Nature's World Conservation Congress (WCC) in Barcelona in 2008, this paper looks in detail at one important site in a high-level international study on 'The Economics of Ecosystems and Biodiversity' (TEEB). The WCC was a site where the TEEB organisers convened three fields of knowledge—economics, ecological and biodiversity sciences, and indigenous knowledge—in an attempt to secure authority for the economic valuation of ecosystems and biodiversity. Through three vignettes, this paper investigates the differential engagement of the three knowledge communities; how these engagements reveal the processes by which global knowledge is constructed; and the political ramifications of those constructions.

Keywords: global knowledge, indigenous knowledge, science, economics, expertise, ecosystem services, biodiversity, global environmental governance, The Economics of Ecosystems and Biodiversity

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INTRODUCTION

We live in an era of growing global environmental governance. Carbon markets, biodiversity offsets, payments for ecosystem services, and a host of other programmes promise to regulate far-flung reaches of the global environment. Although these programmes cover a great many issues and objectives, they all legitimise themselves by laying claim to authoritative knowledge. How emerging forms of global governance come to manage the planet, and with what consequences, rests on their ability to secure a reputation for being both scientifically credible and politically legitimate.¹

The rapid growth in global knowledge—like the Intergovernmental Panel on Climate Change's (IPCC) Assessment Reports on climate change, the International Union for Conservation of Nature's (IUCN) Red List of Threatened

Species, the United Nation's Development Programme's (UNDP) *Human Development Report*, and the International Monetary Fund's *World Economic Outlook*—points towards a world where international decisions are increasingly justified in terms of expert rationality rather than political judgment. Whereas the dictates of the Cold War once directed the allocation of international funds, today states frequently route funding decisions through the technical criteria of international institutions like the Global Environment Facility or The Global Fund to Fight AIDS, Tuberculosis, and Malaria. Following its inception in 2002, The Global Fund, for instance, has USD 18.7 billion in approved performance-based funding, justified on a 'transparent assessment of results against time-bound targets' (van Kerkhoff & Szlezák 2006; The Global Fund to Fight AIDS, Tuberculosis and Malaria 2010). Beyond the allocation of international funding, the shifting landscape of

global governance raises a host of other stakes as well, ranging from the distribution of technological risk, to the shaping of cultural identity, to the identification of global environmental problems (Beck 1992; Taylor & Buttel 1992; Jasanoff 2003).

An extensive ex-post facto literature on global environmental discourse reveals how global knowledge arises and produces political power at a macro-scale (Hajer 1995; Dryzek 1997; Adger *et al.* 2001; Bäckstrand & Lövbrand 2006). Other scholars have explored the international scientific and political transactions across the science-policy interface (van den Hove 2007; Koetz 2008), and the global co-production of scientific and political authority (Miller 2004; Thompson 2004). Relatively few empirical studies, however, look into the day-to-day practices that construct certain ways of thinking and speaking about global knowledge in a way that enables discourses to cohere and gain authority. Such a micro-perspective is critical, however, because it is within the institutional spaces where these everyday practices play out that opportunities for resisting, transforming, or supporting particular forms of global expertise will be found.²

This paper seeks to develop a better understanding of how discussion about the proper role of knowledge was negotiated in one particular site of public debate over ‘The Economics of Ecosystems and Biodiversity’ (TEEB). Begun in 2007 with support from Germany, the UK, United Nations Environment Programme (UNEP), the European Commission, along with a host of academic and private actors, the three-year TEEB study attempts to make a compelling economic case for conservation by producing highly visible, high-quality, peer-reviewed reports.³ The paper focuses on how TEEB spokespeople respond in public discourse to arguments for and against TEEB based on economics, science, and indigenous knowledge, and how this knowledge becomes framed in ways that create credibility and legitimacy for the initiative.

The organisers of TEEB have taken inspiration from another series of prominent scientific reports—the *Millennium Ecosystem Assessment* (MA)—on how to establish a reputation as a credible and legitimate source of knowledge. Like TEEB, the MA encountered difficult questions about how to define and create meaningful global environmental knowledge: What policy change can reports about ecosystems and human well-being realistically achieve? Whom can they benefit? And how can they possibly coordinate large, international processes of expert authorship and review? Unlike the MA, however, TEEB seeks to not only report on the status of the environment but also to develop and spread economic-based tools and methodologies to incorporate economic valuation into decision-making. Thus TEEB faces the daunting task of gathering together a new community of experts, while also pioneering a new form of interdisciplinary expertise that has few obvious equivalents or analogous bodies, whose existing epistemic authority it can leverage when asserting its own knowledge as valid and useful.

Over the course of three years, TEEB has employed numerous strategies to gain recognition as an expert authority.

The study has garnered worldwide attention and was covered in the global media, including the BBC, *New York Times*, *Der Spiegel*, the *Taipei Times*, and *Financial Express of India*. High-profile international conservation meetings have also helped TEEB gain recognition, including venues like the Convention on Biological Diversity’s COP9 and the DIVERSITAS Open Science Conference in Cape Town. This paper explores how TEEB was constructed at one particular site—IUCN’s World Conservation Congress (WCC) in Barcelona during 2008. Interviews and observations at two TEEB panels held at the WCC, along with a close reading of the project documentation and additional interviews with key staff members, provide the case material presented below.

This paper examines WCC as a key site in TEEB’s construction in three sections. The first section situates TEEB institutionally and sketches its organisational structure. The second section sets the rationale for conceiving of TEEB as a rich discourse that is producing new global knowledge from representatives of three previously existing fields of knowledge: economics, the ecological and biodiversity sciences, and indigenous knowledge. The second section also explores the WCC as a site of ‘discursive production’ and offers three vignettes that demonstrate how efforts to establish TEEB play out differently among the three extant fields. The third section concludes with a reflection on the implications the production of global knowledge has for the constitution and exercise of global authority.

BACKGROUND

Germany proposed the idea for a study on the “economic significance of the global loss of biological diversity” at the G8 Environment Ministers Meeting in Potsdam held from March 15–17, 2007 (G8 2007). The proposal appeared as the first of ten positions listed in the Potsdam Initiative, which G8+5 leaders subsequently endorsed at the Heiligendamm Summit held that June (TEEB 2008a). The European Commission, German Federal Ministry for the Environment, and the UK Department for Environment, Food, and Rural Affairs agreed to provide the majority of the funding for a study on The Economics of Ecosystems and Biodiversity (TEEB), to be headed by banker Pavan Sukhdev and a 15-member Advisory Board consisting of “high-ranking experts from policy, economics, and science” (TEEB 2008b).

As study leader, Pavan Sukhdev brings 25 years of experience, including 14 years at Deutsche Bank. He was also a founding member of the Green Indian States Trust (GIST), a green economic accounting project carried out between 2004 and 2008. Results from this project were provided to India’s Supreme Court and are credited with influencing legally mandated rates of forest compensation from development activities in India (TEEB 2008c).

The TEEB Advisory Board includes prominent academic economists, most notably Lord Nicholas Stern, the esteemed author of the UK commissioned *Stern Review on The Economics of Climate Change*, as well executives from the

most prominent international environmental institutions, namely UNEP's Executive Director Achim Steiner, the Convention on Biological Diversity's Executive Secretary Ahmed Djoghhlaf, and IUCN's Director General Julia Marton-Lefèvre. The composition of the Advisory Board speaks to ties that are key to TEEB's promotion and operation. It was due to Marton-Lefèvre's personal request as IUCN Director General, for instance, that TEEB secured two prominent panelled sessions among the competitive and crowded schedule of the WCC (TEEB Session 1). Although not an Advisory Board member, IUCN's Chief Economist, Joshua Bishop, acts as TEEB's Business and Enterprise Coordinator. Similarly, the Secretariat of the Convention on Biological Diversity (CBD) works closely with the TEEB team, while UNEP serves as its official host.

The TEEB study borrows and builds on the content and structure of prior global environmental assessments. Most prominent of TEEB's precursors is the MA, another global, multi-stakeholder initiative that was supported but not formally sanctioned by national governments. The MA generated a framework for conceptualising the relationship between ecosystems and human well-being, which TEEB has used as a common currency in coordinating its own teams consisting of the voluntary expertise of several hundred scientists, economists, and policy analysts.

Two working units in Germany—an administrative and communications hub in Bonn and a scientific coordination team at the Hemholtz Centre for Environmental Research in Leipzig—conduct TEEB's day-to-day operations. Whereas the Bonn office set TEEB's overall strategy, the scientific coordination out of Leipzig tasked expert teams with unfolding a two-phase strategy for developing the TEEB study. TEEB Phase I outsourced much of the early exploratory and scoping work to a number of independent research organisations. In September 2007 and March 2008, two calls for evidence collected over 100 submissions solicited online. March 2008 also marked TEEB's key scoping meeting, an international workshop drawing over 90 experts in economics, ecology and policy from various institutions throughout the world. Phase I concluded in June 2008 with the release of a 64-page Interim Report surveying the global state of biodiversity and ecosystems, and their implications for human well-being. The Interim Report also lays out a framework for economic valuation and suggests how valuation techniques could inform real-world policies through a variety of decision-making techniques and methodologies (TEEB 2008c).

The objective of TEEB Phase II is to further develop the work of Phase I and provide potential end-users with tools for placing economic value on ecosystems and biodiversity. Phase II culminated with a significant presence at CBD COP10 in Nagoya, Japan in October 2010. One of the main products of Phase II is a report on the methodology and state-of-the-science dubbed the *Ecological and Economic Foundations*. Following the MA's strategy to maximise its influence by providing sector-specific summaries, four

additional reports will target the tools and findings to national and international level policy makers, local and regional policy makers, business and industry, and consumers and citizens (TEEB 2008a).

THE WCC AS A SITE OF DISCURSIVE PRODUCTION

If TEEB is to stabilise a new field of global knowledge, one of its most important tasks will be to secure credibility and legitimacy among funders and decision-makers by enrolling a critical mass of experts willing and able to lend their support to a common enterprise. The heavy weighting of economists on the Advisory Board, for instance, is one important means to ensure the perception of economic rigor. Another tactic is the choice of Pavan Sukhdev as the charismatic study leader and astute broker able to span the roles of banker, businessman, and economic expert. A complete survey of the means by which the TEEB study secures credibility and legitimacy, however, would be the subject of another paper. The current paper takes the IUCN WCC as but one strand in a larger web of the TEEB initiative. In doing so, it shows how public argumentation in concrete places works to produce a common discourse that draws its authority from different communities of knowledge.

IUCN, the world's oldest and largest conservation network, convenes over 1,000 government and NGO members once every four years at the WCC to advocate, debate, and publicise global visions for the future. The largest congress to date gathered 8,000 attendees at the Centre de Convencions Internacional de Barcelona from 5–14 October 2008. The event unfolded in two stages: an open Forum of public presentations, workshops, roundtable discussions, art, and theatre, followed by a Members' Assembly dealing with IUCN governance and devising high-level resolutions and recommendations. Case material for this paper is drawn from semi-structured interviews and observation of two 90-minute panel sessions held during the WCC Forum on the 6 and 7 October 2008. Taking place in one of the largest rooms at the conference, these presentations consisted of talks by invited panellists, followed by a question and answer session with a well-attended audience.⁴

This analysis takes the TEEB sessions at the WCC as what Maarten Hajer (Hajer 2006) calls a site of discursive production, where mutually understood norms, rules, and routines condition what may be said, in what manner, by whom, and with what effect. Collectively, these norms, rules, and routines constitute discursive practices that structure and, to some extent, pre-condition the terms and topics on which people are able to speak. As becomes evident in the case material below, this suggests that the ways that people are coming to understand and speak about TEEB is a settlement among multiple ways of knowing. Moreover, the settlement is neither the uninhibited expression of any one set of ideas, nor does it leave the identity of the participants in the emergent settlement unaltered. The paper pays particular attention to how actors attempt to gain discursive authority by defining knowledge claims as either 'scientific' or 'political' in a process

Thomas Gieryn terms ‘boundary work’ (Gieryn 1983, 1999). The following vignettes detail this process of boundary work between three fields of knowledge— economics, science, and indigenous knowledge⁵—as they played out at the WCC.⁶

Challenging Economic Ethics, Asserting Economic Expertise

In his book, *The idea of biodiversity*, David Takacs (Takacs 1996) recounts how in the mid-1980s ecologists and conservation biologists, alarmed over the rapid destruction of species and habitat worldwide, rallied policy-makers and the public behind a new vision of nature. Through a concerted campaign, they wrought the term ‘biodiversity’ into popular imagination, and devised a strategy that reconfigured intellectual pursuits and conservation priorities over the following two decades. While many early arguments for biodiversity conservation made an appeal towards ethics, conservationists are increasingly adopting the economic language of ecosystem services.⁷ Today, TEEB’s economic reasoning promises to elevate concerns over biodiversity loss into finance ministries, development banks, and other powerful institutions where past arguments have gained only fleeting attention.

As a global pioneer for economic arguments in conservation, TEEB made headlines at IUCN’s WCC in Barcelona, where there was a palpable thirst for new models to bridge science and policy. TEEB was the most prominent effort to establish a new form of global knowledge at the WCC and found favour with the highest levels of IUCN. TEEB’s Advisory Board Member and IUCN Director General, Julia Marton-Lefèvre, exercised her privilege to designate a prime slot at the WCC to the session of her choosing by reserving the spotlight for TEEB. Introducing TEEB to the WCC, Marton-Lefèvre explained the move:

It is very important now to move out of discussing the issues of biodiversity and conservation, which we all care about, and move it out from the community that knows all the acronyms, knows what it means, knows what things are serious, and get it into the hands of others that are decision-makers, politicians, the general public. And it seems that, I think you will agree, that economic arguments seem to carry weight with policy-makers, the business community, and more and more obviously, the media and the public.... Efforts to raise visibility about the loss of biodiversity, such as the Millennium Ecosystem Assessment or even our Red List ... have so far failed to marshal convincing economic reasons to conserve nature in the way that we know that it needs to be conserved (TEEB Session 1).

Marton-Lefèvre proceeded to express confidence in the study leader, Pavan Sukhdev. She foresaw that the TEEB Report would be renamed the Sukhdev Report, following the eponymous precedent set by the 700-page Stern Report that inspired TEEB with dramatic projections of the economic costs of unchecked climate change.

During his presentation, panellist Ladislav Miko from the European Commission and TEEB Advisory Board reiterated Marton-Lefèvre’s claim that prior studies like the MA fell short precisely because they did not speak in the economic “language that is mostly understood and used in this globe”:

[The Millennium Ecosystem Assessment] was an excellent study which didn’t address the issue of economics, and that was a gap which we wanted to fill (TEEB Session 2).

While IUCN’s Marton-Lefèvre and the European Commission’s Miko spoke emphatically about TEEB’s political relevance, others experienced in coordinating expertise in the service of global environmental assessment offered more cautionary words. Speaking on the panel, MA Director and TEEB Advisory Board member, Walt Reid, noted that TEEB faces an uphill battle to secure widespread credibility for the economic valuation of biodiversity:

It will be essential that this is an extremely rigorous and credible product because previous attempts to bring economic value issues to bear on biodiversity have actually set us back a little bit, where they’ve come out in a way that hasn’t had that credibility and that really hasn’t stood up to the withering critique of other economists...I think the rigor of this—just like the need for rigor in the IPCC and the Millennium Assessment—is just absolutely critical to its success (TEEB Session 2).

Another panellist, Georgina Mace, a conservation biologist from Imperial College London active in DIVERSITAS and international conservation policy, echoed Reid’s concerns, noting that one of the major challenges to TEEB’s forerunner, the MA, was securing expert assent across a range of disciplines:

[The MA] was built up from lots of expert opinions. In the natural sciences we just about managed to make our opinions converge, in the social sciences they had a little bit more of a problem, and the economists really couldn’t converge at all (TEEB Session 1).

The TEEB Interim Report likewise recognises that securing economic rigour will not be easy, as one of its core obstacles comes from potential disputes over the validity of its valuation methodology:

...the science of biodiversity and ecosystems is still evolving, their services to humanity only partially mapped and imperfectly understood, and the economics used to assign monetary values to these sometimes contentious (TEEB 2008c).

How is TEEB to live up to Marton-Lefèvre and Miko’s political relevance, while also heeding Reid and Mace’s cautionary tales about expert cohesion? More specifically,

what kind of “withering critique” (TEEB Session 2) from outside economists is TEEB vulnerable to? And by what compatible arguments and affiliations does it prove itself relevant to policy? Looking more closely at these questions, a paradox emerges. As TEEB’s critical resource, economics becomes the problem and the solution—both a misguided pursuit and the very resource whose existing policy dominance TEEB leverages as a source of authority. The study’s claim to economic expertise and political relevance walks a tightrope, asserting that it is not at all radical, that it is really nothing new, but that at the same time it is so totally innovative that it deserves to re-order the role of economics in conservation policy the world over.

To dissolve this paradox, the TEEB study impugns not the methodology of conventional economics but its ethics. Contrary to the primacy of aggregate national statistics like GDP, Sukhdev hopes to turn economics to confront ethical dilemmas, particularly as they apply to inter- and intra-generational equity:

If we can get this right, if we can prove to the rest of the world...that, yes, there is an economic case for biodiversity and ecosystems, then we would have turned upside down the basic counter-argument, which is, ‘Oh well, you don’t respect poverty and the needs of development, you don’t respect the needs of progress.’ That is not true. That is just bad economics. I can tell you that (TEEB Session 2).

Sukhdev also stated yet more bluntly, “Economics is mere weaponry, its targets are ethical choices” (TEEB Session 2).

At the same time the TEEB study launches its ethical challenge, it redoubles its demonstration of methodological rigour. In one telling exchange during the session, an environmental planner from the audience contested TEEB’s selection of discount rates and inattention to economic growth for the poor, to which Sukhdev genially but firmly responded with a point-by-point rebuttal grounded in economic theory.

Given the delicacy of the claim to simultaneously speak for and against economics, the WCC offered the safe environs of a conservation conference, where orthodox economists might not be expected to be protesting en masse. In doing so, TEEB claims the methodological credibility of mainstream economics for its own, while simultaneously asserting and then distancing itself from the discipline’s ethical and political illegitimacy. Yet, while this may be effective in securing assent from economists and policy-makers, it also leaves the argument vulnerable to critiques from other knowledge communities with fundamentally different cognitive and normative bases. As the following sections demonstrate, such cognitive and normative complications manifest in arguments made in the name of science and indigenous knowledge.

Containing Disputes Over Biodiversity, Ecosystems, and Ecosystem Services

Unlike the unified stance the TEEB study takes on economic

credibility, it openly acknowledges scientific fault lines in the relationship between biodiversity, ecosystems, and ecosystem services. These divisions can be traced to discussions among three scientific communities in the early 1990s: nature conservationists (conservation biologists, conservation NGOs, and many government agencies), ‘hard core’ ecologists and biologists (evolutionary and community ecologists motivated to study biodiversity itself), and system scientists (ecosystem biologists, engineers, climate change scientists, bio-geochemists). In the early days, ecosystem services were at one end of ecosystem studies, and focused on tangible deliverables like food and freshwater, which the scientific communities interested in biodiversity considered “very functional, rather dull, a bit utilitarian” (Personal interview on October 8, 2008 at WCC).

At first, the closely linked nature conservationists and hard-core ecologists and biologists did not want to join the system scientists’ vanguard promoting ecosystem services. A TEEB advisor with many years of experience in biodiversity science and policy recalled:

There was a strong feeling in what is now the biodiversity community that we shouldn’t get involved in that stuff because it’s a very different area. The biodiversity community...was strongly motivated and interested in diversity itself—by how many species there are, how many different kinds of interactions, how interactions between different kinds of biodiversity lead to ecosystem functions, where functions are everything and services are a tiny proportion of it. So, the two things were really very different (Personal interview on October 8, 2008 at WCC).

Despite these disputes over the relationship between biodiversity and ecosystem services, the substantial traction that ecosystem services came to have with governments helped to sway many nature conservationists, ecologists and biologists to join the system scientists to advocate for such an approach in science and policy. By 2005, the MA yielded a significant conceptual leap by diversifying the definition of ecosystem services in a way that satisfied elements of all three scientific communities. Yet, according to the TEEB advisor quoted above, tensions persisted in the MA over how to relate biodiversity to ecosystem services:

At that time (during the early 2000s) biodiversity was an ecosystem service. In bits of the MA it still is, which is ridiculous. That is conceptually ridiculous because how can biodiversity be an ecosystem service when most ecosystem services depend on biodiversity? (Personal interview on October 8, 2008 at WCC).

These unresolved tensions resurfaced at the WCC in challenge to the ambiguity of the very title, ‘The Economics of Ecosystems and Biodiversity’:

Is it the economics of ecosystems and biodiversity, where

biodiversity is part of ecosystems, or is it the economics of ecosystems and economics of biodiversity? It turns out they [TEEB] are not even going to think about the economics of biodiversity. They are going to think about the economics of ecosystem services per se. The people who were worried about throwing the diversity into ecosystem services probably have good reason (Personal interview on October 8, 2008 at WCC).

The most pointed scientific challenge at the WCC to TEEB's mission of monetising ecosystems and biodiversity came from Kent Redford, Director of the Wildlife Conservation Society Institute. Redford, who has published critiques that impugn ecosystem services as a dangerous distraction (Redford & Adams 2009), attacked the "science that is underpinning the conclusions" of the report:

My concern is that the study and these efforts—though I understand the political expediency and demand for them—may end up putting us in a position that is one that in a number of years we will rue having made. We do not understand the links between species richness and the richness of different systems and the services that are valued by humans that underlie them (TEEB Session 1).

In addition to questioning TEEB's scientific credibility, Redford criticised its title, "which distinguishes between ecosystems and biodiversity, as a very worrying and telling kind of statement." He then proceeded to make a second protest over the myopia of a services-based strategy:

...that it is really an environmental value of the natural world for humans. It is not a biodiversity conservation value per se. What we're doing is giving a hope and a prayer that the conservation dimension of this will be supported by the environmental one, while our colleagues in the genetic engineering world are busy preparing new life forms, which may very well provide more environmental services than the natural world does (TEEB Session 1).

In the above two quotations, Redford articulated the epistemic and strategic objections dividing nature conservationists and conservation biologists over whether or not TEEB is a scientifically vapid and politically expedient fad, or a bona fide and politically relevant field of knowledge. The responses to Redford's objections reveal how other scientists and economists accommodated his critique, yet did so in a way that retained TEEB's claim to scientific credibility. Notable for her position as a panellist and well-respected conservation biologist, Georgina Mace replied to Redford's challenge with a conciliatory note:

I, of course, agree with Kent Redford's point about this potential disconnect between biodiversity and ecosystem services. I think that is really important to address, but it is also really important that we don't hold up the work

of getting economic valuation done. We have addressed complex issues like this in other sectors. You just have to accept a no regret point at which you set the limits, recognising that there are some things that are not understood (TEEB Session 1).

Instead of attacking TEEB's conservation science, Mace suggested that a degree of uncertainty is inevitable in policy-relevant science, and that IUCN members could contribute a great deal to it through better measures of biodiversity, resilience and ecosystem thresholds.

Sukhdev also assuaged scientific dissent by stating that economic measurement deferred to the limits set by scientific knowledge, and that Phase II of the TEEB study would pay more attention to non-monetary measurements of biodiversity, resilience, and ecosystem thresholds as per Mace's suggestion. Furthermore, he appealed to the scientific community's expertise as a means to improve the study:

Hopefully, with the help of all of you we will come up with a means of monetising, or at least providing additional information (TEEB Session 1).

Amid these appeals, Sukhdev reiterated the centrality of science to TEEB's success: "All of this rests on the firm foundation of science, of science and economics" (TEEB Session 2). These words suggest deference towards scientific authority, which is taken to be a critical ingredient in the monetisation of nature. What a firm scientific foundation means, however, remains open to debate. Given the credibility troubles that would befall TEEB sans scientific imprimatur, it must successfully manage scientific dissent of the kind Redford introduced at the WCC. How then is TEEB to respond to the divided opinion about what constitutes good science among biodiversity and ecosystem scientists? Is it to carry on, as in Phase I of the study, by following a systems science emphasis on the emergent properties of ecosystems, yet risk alienating the biodiversity scientists who argue for greater attention to the dynamics of species diversity and interaction? Or is TEEB to heed the concerns of biodiversity scientists by introducing non-monetary measurements of biodiversity, resilience, and system thresholds, but dilute and possibly undermine the report's economic message? Whatever the answer to these questions, they imply that negotiations over what counts as credible science will impinge on both the content of the report and its implications for policy.

A second, subtler dynamic is also evident in TEEB's management of scientific dissent when one considers which objections from scientists TEEB accommodates and which it ignores. Redford, for instance, critiqued both TEEB's biodiversity science and its strategy of using economic valuation to instigate policy-change. Sukhdev and Mace's responses, though, only accommodated the former critique by promising to include better scientific measures in the future but ignored the latter by holding on to the idea that economic valuation is the best way to influence policy. The

selective response implies that TEEB representatives are more concerned with securing widespread scientific credibility than accommodating objections scientists might offer on political or strategic grounds. As we will see in the following section, a similar but altogether distinct discursive dynamic is at play with regard to indigenous knowledge. Rather than treating indigenous knowledge as a resource for epistemic credibility, TEEB handles it as one of political legitimacy.

Translating Indigenous Knowledge

Andrew Mitchell, Executive Director of Canopy Capital, described his company's rationale for the economic valuation of ecosystems and biodiversity at the WCC TEEB session:

The Amazon is a huge green machine. There are about four of them of that size around the planet: the Ghana Shield, the Congo Basin, and those of Southeast Asia.... Our idea was to look at these forests like a giant public utility, providing a service that we all use but we don't pay for.... No one is going to give you a billion for butterflies or bears, but they might give you a billion for a forest and what it does for us (TEEB Session 1).

Another panellist, Julian Mathews, founder of the travel company Discovery Initiatives, echoed Mitchell's sentiment when he praised the idea that mountain gorillas "are now treated by the Ugandan government as oil fields" (TEEB Session 1).

It is unlikely that giant green machines and gorilla oil fields were in mind when an Inuit representative in the audience explained how nonsensical his Yukon community would find the economic valuation of nature. Rather than conceiving of nature as having an economic value that could be known independently from the act of knowing, he described the value of nature as being produced "very much in our knowledge and interactions with nature" (TEEB Session 1).

Panellist Victoria Tauli-Corpuz, Chairperson for the UN Permanent Forum on Indigenous Issues, put the inseparability of nature and culture yet more bluntly:

For a lot of indigenous peoples in the world the things that matter most to them are not just the economic value but, of course, the cultural and spiritual values of ecosystems and biodiversity. I think that we always talk about biodiversity side by side with cultural diversity because in our own life we cannot separate the two (TEEB Session 1).

Tauli-Corpuz later stressed that indigenous people have a world-view quite apart from the one of economics:

I think that the point has been made over and over again by indigenous peoples that really valuing something in economic terms has a lot of limitations.... Biodiversity loss is not just caused by the physical cutting of the forest but

also the culture, the values, the mindset, the philosophies of people who are taking care of those forests. I think that we have to look at that mindframe and understand it better and see how it also can influence the policies that governments and businesses will come up with in the end (TEEB Session 1).

In response to Tauli-Corpuz, panellist Jochen Flasbarth, TEEB Adviser and Director General for Nature Conservation at the German Ministry for the Environment, agreed that in the future TEEB should do more to "capture knowledge of indigenous people" (TEEB Session 1). Flasbarth's reply acknowledged the relative lack of attention TEEB had given to indigenous knowledge but did so in a way that depicted it as simply another biodiversity data point. Indeed, the sole reference in the TEEB Interim Report (TEEB 2008c) to indigenous knowledge awkwardly positions it alongside the valuation of marine resources and genetic material, as an "under-researched" area that can service "gaps in the coverage of the valuation literature".

Flasbarth also appeared to suggest that in invoking an indigenous critique of economic valuation Tauli-Corpuz was simply making the case that such tools were of limited value for indigenous people attempting to secure greater political rights. He stressed that economic knowledge was but one means among many to influence decision makers, and that it does not mean "that you are allowed to ignore indigenous peoples' rights" (TEEB Session 1). Seen in this light, arguments for political rights, like aesthetic or ethical ones, are simply additional tools in the toolbox, and can co-exist alongside TEEB's economic arguments because economic valuation is simply "another, very important instrument that doesn't say anything about the hierarchy of arguments or ethical, moral, or aesthetic concerns" (TEEB Session 1).

Pavan Sukhdev offered a slightly different answer to Tauli-Corpuz's call to talk about biodiversity and cultural diversity together, when he admitted that, "Cultural values and biodiversity values do go hand in hand. That's probably mentioned in our first phase but in more detail should be explored in the second phase" (TEEB Session 1). Here, cultural values appeared as one more group of benefits that nature provides people, alongside amenities like food, freshwater, and fertile soils.

Both Flasbarth and Sukhdev agreed with Tauli-Corpuz and the Inuit representative that indigenous knowledge and cultural values deserve more attention, but, unlike the indigenous representative, maintained a clean separation between the two. Flasbarth spoke, on the one hand, of indigenous knowledge as a resource to enhance the quality of TEEB's biodiversity science and, on the other hand, the legitimate place for indigenous rights, while Sukhdev claimed to recognise that TEEB's valuation exercise had not attended to the cultural value of biodiversity as closely as it should have.

Yet, do any of these three acknowledgements—of knowledge gaps, valuation gaps, and political rights—really address Tauli-Corpuz and the Inuit representative's concerns? A close

reading of their statements suggests that their concern with economic valuation is neither that it fails to appreciate the scientific merit of indigenous knowledge, nor that it overlooks cultural values or political rights.⁸ Rather, both Tauli-Corpuz and the Inuit representative indicated that the translation of indigenous knowledge into economic terms fails to appreciate that the ways in which indigenous people know the world are integral to the ways they live in it. As anthropologists like Paul Nadasdy argue, attempts to integrate traditional ecological knowledge with science tend to distil bits and pieces of the former's lived-world into the graphs, numbers, tables, and theories of the latter (Nadasdy 1999). A major consequence of this so-called integration is to mine traditional knowledge for particular kernels of data, and thereby compartmentalise interwoven knowledge of place, narrative, history, and nature into the discrete bins, for example, of wolf population counts for wolf biologists or the medicinal properties of plants for botanists.

In the meantime, those aspects of traditional ways of knowing and living that do not conform to scientific understandings are either ignored or re-interpreted in a way that is consistent with the scientific or political registers they are made to speak. Thus, we see Flasbarth disaggregate traditional knowledge into scientific elements that can be 'captured' but overlook Tauli-Corpuz's claim that indigenous knowledge goes beyond data about biodiversity to include knowledge about culture, values, and other drivers of habitat destruction.

If indigenous ways of knowing and living cannot be cleanly compartmentalised to fit the disciplines of science and economics, then attempts to translate indigenous knowledge into those disciplines destroy something of the knowledge and life of which it is part. Writing in a volume commissioned to reflect on the MA, Peter Brosius recognises the dangers of binning indigenous voices into either the language of knowledge or rights:

Whether our goals are purely instrumental—rendering local voices and local knowledge into forms that are useful in managerial terms—or emancipatory—rendering local voices into compelling narratives designed to secure rights—those local voices are situated in a subject position (Brosius 2006).

Brosius argues for the liberation of local voices from what he calls a subject-position by creating environmental assessments that solicit local knowledge holders for the same stamps of credibility, salience, and legitimacy typically sought through scientific review. In this scenario, global assessments would ask indigenous knowledge holders for their views on the assessment's political as well as scientific dimensions.

If indigenous people are not included in the production of global environmental knowledge on their own terms, there is the possibility that their inclusion will underwrite the authority of a project without their consent. Incentives for this result certainly exist, highlighted, for instance, through Flasbarth's

acknowledgement that legitimacy is a real concern for TEEB because the effort cannot be seen as a European Union or German project, nor an attempt by industrialised countries to gain control over developing countries' biodiversity (TEEB Session 1). Like the selective uptake of arguments from conservation scientists in a way that primarily secures scientific credibility for funders and decision-makers, the compartmentalisation of indigenous arguments into bins labelled knowledge or politics may improve the standing of TEEB among scientists and policy-makers but alienate indigenous people themselves.

CONCLUSION

The above vignettes from the TEEB sessions at the WCC illustrate micro-practices that are constructing a new economics of ecosystems and biodiversity. Although no single actor controlled the discourse, the play of arguments about the status of different kinds of knowledge reveal a subtle process by which actors select, frame, contest, and ignore arguments according to the identity of the speaker and the knowledge that the speaker represents. Moreover, these vignettes demonstrate how actors engaging in this process perform boundary work by positing different kinds of knowledge as either 'scientific' or 'political' in order to construct credibility and legitimacy for the TEEB initiative.

Of the three fields of knowledge under discussion—economics, science, and indigenous knowledge—TEEB representatives advocated most vigorously for economics as the study's centrepiece and great policy contribution. To make a strong case for their vision of economics, TEEB representatives claimed the discipline's robust and rigorous methodology for their own, while distancing themselves from what they described as mainstream the ethically pathological dominance of economics in decision-making. In this respect, TEEB's economics became a dual epistemic and ethical resource. By contrast, scientists who contested both TEEB's science and its politics only gained purchase with the former critique, as scientific credibility constitutes an essential element of TEEB's epistemic authority. The third field, indigenous knowledge, created a quite different response, with TEEB representatives placing knowledge claims made by indigenous representatives under a scientific or economic lens, or re-interpreting them in political terms.

In this sense, the WCC is a site of discursive production that, rather than adjudicating arguments in a neutral manner, re-articulated them in a way that enhances TEEB's credibility and legitimacy among target audiences. The discourse thus emphasises the vision charted by TEEB advisers like Jochen Flasbarth, who highlighted the need to overcome suspicion among NGOs who, in strategic myopia, see biodiversity as "much closer to God than to bankers". Another adviser, Julia Marton-Lefèvre, similarly set the role of economics beyond dispute when she prognosticated: "The TEEB study will generate increased awareness in the economic significance of biodiversity loss, and will actually generate the action that

we need to change the way the world is being run right now” (TEEB Session 1).

Highlighting the privilege of economics in the discourse at the WCC is, of course, not to assume that the TEEB sessions were intended to be fully participatory, nor to indict TEEB’s economic vision. It instead shows that the process of building authority for global knowledge tends to re-articulate contradictory arguments in ways that may not be consistent with the intent of those who originally spoke them. To the extent that these re-articulations build support for a project that excludes those original judgments, the project risks turning reasoned disagreements into unbridgeable alienation, with negative consequences for both TEEB and the very communities that produce its credibility and legitimacy. Yet, other democratic models for constructing global knowledge that might avoid these pitfalls do exist. Indeed, they exist within the TEEB Advisory Board itself.

Panellist and TEEB Advisory Board member Joan Martinez-Alier endorsed an approach of epistemic pluralism. The ecological economist supported TEEB for tactical reasons but sparked spontaneous applause when he argued for an “orchestra of instruments”:

Economic valuation is an instrument that some people understand very well, and it is very relevant, but we have a whole orchestra of instruments to talk about different valuations. Territorial rights, aesthetics, ecological sacredness for many people around the world, tribal people, are also very relevant values. There is an incommensurability of values that we have to recognise (TEEB Session 1).

To Martinez-Alier’s epistemic pluralism, TEEB’s study leader, Pavan Sukhdev, remarked:

Your inputs are vital and extremely well appreciated.... The orchestra of instruments could well be something that we explore in TEEB II because there is space for that (TEEB Session 1).

What would an orchestra of instruments mean in practice? To find an answer to this difficult question, we might turn to recent experiments in the production and use of global environmental knowledge—such as the MA, Arctic Climate Impact Assessment, and Indigenous Peoples Climate Change Assessment—that are imagining new ways to secure credibility and legitimacy suited to the plurality of problems, places and peoples that so often threaten to divide and unsettle knowledge for environmental decision-making. A major innovation of the MA, for instance, was its emphasis on sub-global assessments tailored to particular knowledge and decision-making contexts that, through a common but relatively loose conceptual framework, provided an institutional mechanism for diverse cultures to ‘reason together’ (Miller & Erickson 2006). Approaches of this sort that creatively reconcile the local and the global will be critical if the new economics of biodiversity and ecosystems is to successfully navigate the epistemic and

political complexities of a rapidly globalising world (Jasanoff & Long Martello 2004; Long Martello 2004). Recognising the political dimensions of expertise in such a divided and uncertain world, the conservation community would do well to consider how these and related ideas could contribute to a truly new, robust and effective means to know and govern the global environment.

Notes

1. Credibility refers to the belief that knowledge is accurate, valid, authoritative, and trustworthy (Price 1965; Wildavsky 1987; Shapin 1996; Cash *et al.* 2003). Legitimacy denotes the acceptance of knowledge as having been produced through a fair and accountable process (Price 1965; Wildavsky 1987; Shapin 1996; Cash *et al.* 2003).
2. Scholarship on transnational expertise invokes many, partially overlapping concepts—epistemic communities (Haas 1990, 1992), discourse coalitions (Hajer 1995), global knowledge networks (Stone 2005), embedded knowledge networks (Sinclair 2005), or international knowledge institutions (Miller 2007). Whatever their label, all such efforts face the challenge of creating and stabilising both global knowledge and the social organisation that supports it. As scholars of science and technology studies have explored at length, the ways people understand and order the natural world are deeply implicated in the ways they understand and order themselves—that is, natural and social orders are co-produced (Shapin & Schaffer 1985; MacKenzie 1989; Ezrahi 1990; Latour 1993; Gieryn 1999; Nowotny *et al.* 2001; Jasanoff 2004).
3. For the sake of brevity, this paper uses the shorthand TEEB to refer to what might be more fully called the TEEB effort or initiative, consisting of the core organisational and advisory staff charged with setting and realising a strategic vision.
4. The first session was moderated by conservation reporter and film producer, Robert Lamb, and included invited speakers and panellists from the TEEB Advisory Board, including Julia Marton-Lefèvre, Director General, IUCN; Jochen Flasbarth, President, German Federal Environment Agency; Walt Reid, Director, MA; and guest speakers, including Georgina Mace, Imperial College London; Julian Mathews, Founding Director, Discovery Initiatives; Andrew Mitchell, Executive Director, Canopy Capital; Victoria Tauli-Corpuz, Chairperson for the UN Permanent Forum on Indigenous Issues; and Tom Albanese, Chief Executive, Rio Tinto. The main speakers in the second session were TEEB Study Leader, Pavan Sukhdev (also in session 1), and Ladislav Miko from the TEEB Advisory Board and Czech University of Life Sciences.
5. Economics, science and indigenous knowledge are exceptionally broad terms. Here their definition follows the actors’ usages. The economics inside of TEEB includes ecological and environmental economics, which is implicitly at odds with the orthodox economic analysis seen to dominate decision-making, most notably neo-classical economic. Science encompasses the natural sciences that study ecosystems and biodiversity, as well as conservation biology, socio-ecological research, and adjacent areas that incorporate humans into the study of natural systems. Indigenous knowledge is ambiguously taken to include cultural and/or natural understandings, and is often taken as sibling of local or traditional knowledge.
6. Quotations attributed to individuals were spoken publicly during the two TEEB paneled sessions held on the 6 and 7 October 2008. Anonymous quotations are from interviews conducted at the WCC.
7. Contrast, for example, the title of the recently announced Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services with that of the Global Biodiversity Assessment conducted in the mid-1990s.
8. That is not to assume, however, that they or indigenous people more broadly do not consider knowledge epistemic or political critiques unwarranted but only that in this setting they were making additional arguments that went unanswered.

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