

## **‘TEEB Begins Now’: A Virtual Moment in the Production of Natural Capital**

**Kenneth Iain MacDonald and Catherine Corson**

---

### **ABSTRACT**

This article uses theories of virtualism to analyse the role of The Economics of Ecosystems and Biodiversity (TEEB) project in the production of natural capital. Presented at the 10th Conference of the Parties to the Convention on Biological Diversity, the project seeks to redress the ‘economic invisibility of nature’ by quantifying the value of ecosystems and biodiversity. This endeavour to put an economic value on ecosystems makes nature legible by abstracting it from social and ecological contexts and making it subject to, and productive of, new market devices. In reducing the complexity of ecological dynamics to idealized categories TEEB is driven by economic ideas and idealism, and, in claiming to be a quantitative force for morality, is engaged in the production of practices designed to conform the ‘real’ to the virtual. By rendering a ‘valued’ nature legible for key audiences, TEEB has mobilized a critical mass of support including modellers, policy makers and bankers. We argue that TEEB’s rhetoric of crisis and value aligns capitalism with a new kind of ecological modernization in which ‘the market’ and market devices serve as key mechanisms to conform the real and the virtual. Using the case of TEEB, and drawing on data collected at COP10, we illustrate the importance of international meetings as key points where idealized models of biodiversity protection emerge, circulate and are negotiated, and as sites where actors are aligned and articulated with these idealized models in ways that begin further processes of conforming the real with the virtual and the realization of ‘natural capital’.

---

The authors would like to thank participants in the CBD Collaborative Event Ethnography (CEE), a group of researchers engaged in the ethnographic study of conservation institutions. CBD–CEE members conducted collective fieldwork during the 2010 Conference of the Parties to the Convention on Biological Diversity and are committed to the collective sharing of data and analysis arising from that fieldwork. A special thanks to Bridget Brady, Iliana Paul, Bliss Parsons and Ahdi Mohammed for the help in data analysis, as well as three anonymous reviewers who commented on earlier versions of this manuscript. Research support came from the National Science Foundation grants 1027194 and 1027201.

*Development and Change* 43(1): 159–184. DOI: 10.1111/j.1467-7660.2012.01753.x

© 2012 International Institute of Social Studies.

Published by Blackwell Publishing, 9600 Garsington Road, Oxford OX4 2DQ, UK and 350 Main St., Malden, MA 02148, USA

## INTRODUCTION

In the summer of 2007 a reader of the London-based *The Independent* posed a question to former US Vice-President Al Gore: ‘In 1992 you advocated a new set of “rules of the road” for the conduct of the global economy, to take account of environmental costs and benefits. What progress do you think has been made since then?’<sup>1</sup> Gore responded:

Not nearly enough. And actually, a re-examination of accounting systems and measurement protocols to include the environment in the routine, everyday calculations by which our economy is governed, comes about as close as you can get to the heart of why we have this crisis . . . accounting systems are required to hold routinely in mind factors that are deemed to be important and significant in weighing the pros and cons of any decision. There has been progress to reform and redesign the accounting system. But not nearly enough.<sup>2</sup>

Gore’s remarks were prescient. They were uttered just four months after a German proposal to study the ‘economic significance of the global loss of biological diversity’ had been adopted at the 2007 Potsdam G8(+5) meeting. Three years later, while introducing the resulting report — The Economics of Ecosystems and Biodiversity (TEEB) — at the 10th Conference of the Parties to the Convention on Biological Diversity (CBD/COP10), the project leader Pavan Sukhdev, a former senior banker with Deutsche Bank and head of the United Nations Environment Programme’s (UNEP) Green Economy Initiative,<sup>3</sup> made a striking comment: ‘This is one world; it’s ours to create. Let us create it and make it what we want, rather than wait for it to be dictated to us through further crisis and further problems’.

These comments from Gore and Sukhdev neatly reflect the rhetorical force of ‘natural capital’. The world that TEEB seeks to create is one that materializes Gore’s image of a nature simultaneously ‘accounted’ for and made subject to market exchange. In many ways, however, this attempt to bring nature into alignment with an expressed vision of that world is nothing new. It reflects the process that Carrier and Miller (1998), among others, have described as virtualism, or the attempt to make the world around us look like and conform to an abstract model of it. These abstractions, they claim, become virtualism when virtual reality stops simply being a description of reality and becomes prescriptive of what the world should be.

‘Nature’ has always been brought into being through processes of abstraction — ways of cognitively imagining one’s surroundings as existing in particular ways for particular reasons such that they can be acted upon toward particular ends — and in the past two decades, a particular image

- 
1. Bernard Payne, Question put to Al Gore in *The Independent* 7 July 2007.
  2. Response to Bernard Payne, from Al Gore in *The Independent* 7 July 2007. Lohmann (2009) also cites this quote by Al Gore.
  3. Sukhdev also chairs the World Economic Forum’s ‘Global Agenda Council’ on Biodiversity, and was a speaker at Davos in 2010 and 2011. He serves on the boards of Conservation International and the Stockholm Resilience Centre.

of 'the world' as 'natural capital' has gained prominence. The realization of this vision has entailed the privatization of new rights to nature, the creation of new commodities, and the establishment of new markets for their exchange.<sup>4</sup> These processes are not only intertwined with the concept of 'ecosystem goods and services', but are also actually creating markets for their exchange (Robertson, 2007; Sullivan, 2011). Importantly, many new nature commodities are virtual, in which buyers consume images and other abstractions of nature, such as internet purchased carbon offsets, rather than nature itself (e.g. Carrier and West, 2009; Igoe et al., 2010).

In some sense this is not new: even if the phrase 'natural capital' has not been in wide circulation until recently, components of what industrialized societies called 'nature' were implicitly treated as capital. What is new is a striking reduction in the opposition to the idea of a natural world defined as capital. Environmental institutions such as the CBD that might have challenged the subordination of 'nature' to 'the economy' have rapidly become strong proponents of market-based mechanisms like public-private partnerships, payment for ecosystem services, biodiversity offsets, carbon trading, ecotourism, corporate social and environmental responsibility and green consumerism. This is what might be thought of as a form of cynical environmentalism — the transformation of what is conventionally thought of as environmentalism through intertwined processes of professionalism and neoliberalism that have deprived environmentalism of much of its oppositional potential, and aligned it with projects of capital accumulation.

What interests us here are questions about the dynamic processes and contexts in which new markets and property relations are created and defined, and in which power relations are realigned (McCarthy and Prudham, 2004). How is 'natural capital' enacted and how are the conditions that create the abstractions upon which it depends produced and re-enforced? This process, we suggest, requires the continual (re)alignment<sup>5</sup> of actors, labour and mechanisms around specific interests and ends. And alignment involves substantive efforts of articulation (Hall, 1986),<sup>6</sup> circulation and orchestration in attempts to enlist actors, institutions and instruments in the project of

---

4. For overviews see Brockington and Duffy (2010); Castree (2008); Heynen et al. (2007); Igoe and Brockington (2007); McCarthy and Prudham (2004).

5. By alignment we mean the orientation of actors toward the virtual reality out of which the virtualism is created, in our case natural capital. Alignment is facilitated when actors are exposed to the configuration of power around what they see as particular projects and envision ways in which their multiple interests can be met through an affiliation with those projects.

6. Hall defines articulation as both the joining together of diverse elements and expression of meaning through language. For Hall, articulations are made in historically specific contexts. They are temporary, contingent on material and discursive factors, but never determined. We use articulation to refer both to the realization of that affiliation through the linking of their ongoing activities with the agencement, and also to the expression of that linkage (aurally, textually and visually) in ways that extend and contribute to the strength of the agencement.

(re)producing what we once knew as ‘the environment’, or ‘nature’, as ‘natural capital’ (see Mitchell, 2008). While we see this as an integrated effect of neoliberalism, our focus is not on neoliberalism per se, but on revealing the important role of performance,<sup>7</sup> and the enactment of expertise and authority in the work of alignment and articulation that neoliberalism (in all its variegated forms) requires. That work is an important component of what Carrier and Miller (1998) describe as virtualism, and is critical to understanding how processes of virtualism limit political alternatives to the commodification of nature.

In this article, we combine the theoretical lens of virtualism with the empirical object of a new multi-lateral project — TEEB and the physical site and instance of the CBD/COP10 — to explore how processes of performance, orchestration, alignment and articulation stitch together a dense weave of interests and actors in an effort to make real a vision of ‘nature’ as capital. We argue that TEEB is part of a larger political project in which the reification of the market as the solution to all environmental ills is achieving dominance. Of course this does not happen without some resistance, but as environmental organizing, particularly in the realm of biodiversity conservation, has become professionalized and institutionalized — with the accordant modes of conformity generated by professionalism — and as environmental organizations have increasingly confronted fiscal constraints, the CBD (and institutions like it) have acquired an authority to legitimize organizations and channel resources to them in ways that facilitate their reproduction and, consequently, diminish resistance. Accordingly, organizational attitudes and positions around a new institutional environment involve not only a concern with continuing access to decision making, but also the legitimacy needed to continue to secure increasingly important project-based funding. It also indicates that a significant part of gaining this legitimacy includes the willingness and capacity to develop ‘working alliances’. As institutional environments, shaped by neoliberalism, increasingly accommodate and privilege the interests, logics and mechanisms of market actors, access to the resources allocated through those institutional contexts encourage organizations to visibly and legibly align their activities, capacities and objectives with those logics and mechanisms (MacDonald, 2010a).

First proposed by the German government at a 2007 meeting of the environment ministers of the G8 + 5, TEEB began as a study on the economics of biodiversity loss. While officially hosted by the Kenyan-based UNEP, TEEB’s working units, including a communications hub and a scientific coordination group, were located in Germany and financed by the European Commission, Germany, the United Kingdom, Norway, the Netherlands and Sweden. Led by Pavan Sukhdev, whose credentials in the financial sector and as an environmental outsider gained him legitimacy, the project’s goal

---

7. Where performance includes the scripting, structuring and staging of economic expertise.

was to produce a Stern Report<sup>8</sup> for biodiversity. As it unfolded, TEEB linked and mobilized a group of actors focused on the pricing and costing of ecosystems and biodiversity, producing reports aimed at distinct bodies of decision makers and putting in place demonstration projects oriented around mechanisms to incorporate the productive value of ecosystems and biodiversity in national accounts.

TEEB, then, is performative; a project that, even as it claims to be descriptive of the world, actively works to bring the world it describes into being by circulating and promoting its ostensibly descriptive models as the best basis for policy and action. While this 'performativity of economics' paradigm has historically been associated with studies of particular market technologies generated at relatively local and specialized sites (e.g., Callon, 1998; Garcia-Parpet, 2008; Holm, 2008; Mackenzie, 2003; MacKenzie et al., 2008), more recently, the concept of economic performativity has been shifted into a broader research agenda concerning processes of 'economization', an agenda inclusive of a much larger variety of sites and practices (Çalışkan and Callon, 2009, 2010). With this in mind, we emphasize the performativity of a conference site — the CBD/COP, where social relations constitute more than a dialogue among states, and where the site itself serves as a stage that conditions the agency of TEEB in the production of 'natural capital'. In revealing the work of TEEB as performative, we highlight the importance of particular sites and spaces in the (re)production of agencements that we see as essential for an understanding of virtualism. Its release and institutionalization represent pivotal moments in the merging of economic and ecological rationale, and it has mobilized the alignments and articulations required to overcome obstacles to the realization of 'natural capital'. In this sense, it is an institutional expression of an environmental vision, intended to bring the world into conformity with that vision (Carrier and West, 2009). The resulting restructuring of socio-natural relations and the associated shifts in global environmental governance simultaneously contain oppositional politics and create the very conditions for the emergence of new markets for nature's exchange, in spaces and through practices that are 'out of sight' for many of the people they will ultimately affect.

In what follows, we use our observations on TEEB to further refine the concept of virtualism, asserting that virtualism begins with an ideological commitment, in this case to place an economic value on nature. Yet, we also understand virtualism to be an ongoing process of reproduction grounded in conditions of contestation, where directionality emerges from the configuration of power relations and agency continually in the making. This means that any virtualism must be linked together through virtual moments. It also demands that virtualism be performative — making the world conform to

---

8. Based on The Stern Review on the Economics of Climate Change (2007), a study led by Sir Nicholas Stern, Head of the UK Government Economic Service and Adviser to the Government on the economics of climate change and development.

an image of itself requires constant orchestrating, aligning and articulating actors, interests, institutions and mechanisms to turn fragile social ties into durable associations (Latour, 2005).

### VIRTUALISM: CONFORMING THE WORLD TO AN ABSTRACTION

Carrier and West (2009) argue that a ‘set of partial analytical and theoretical arguments that define a world . . . becomes a virtualism when people forget that the virtual reality is a creature of the partial analytical and theoretical perspectives and arguments that generate it, and instead take it for the principles that underlie the world that exists and then try to make it conform to that virtual reality’ (2009: 7). In this sense, virtualism ‘is a social process by which people who are guided by a vision of the world act to try to shape that world to bring it into conformity with their vision’ (Carrier and West, 2009: 7), and do so with material effect (MacKenzie, 2007: 357). This capacity, however, is not undifferentiated. Miller (2003, 2005), for example, discusses the correspondence between powerful actors, powerful discourses and the degree of control they come to exercise over the world through their ability to be performative, with the more powerful exercising ‘the ability to construct an economic world as the pure product of their own performativity, . . . reflecting their ability to take the virtual (i.e., the model) and actualize it in the world’ (Miller, 2005:10). We argue, however, that understanding processes of ‘realizing the vision’ of ‘natural capital’ does not entail distinctions between more or less powerful actors, but requires understanding how configurations of actors — in which we include devices, institutions, organizations (Latour, 2005) — are brought into being and how those orchestrated configurations of diverse actors become the reality they seek. It is the contestation among a multitude of actors, where power is relational, contingent and dynamic, that is important. Here, we draw on what Foucault (1980) called a *dispositif*<sup>9</sup> or what Callon has termed an *agencement* — by which he means a heterogeneous ensemble of actors ‘made up of human bodies but also of prostheses, tools, equipment, technical devices, algorithms, etc.’ (Callon, 2005: 4), and which he uses to ‘denote sociotechnical arrangements when they are considered from the point of view [of] their capacity to act and give meaning to action’ (Callon and Çalışkan, 2005: 24). Callon’s perspective is helpful because it premises the effectiveness (i.e., its capacity to do work)

---

9. In using the term *dispositif* Foucault pursues three conceptual ends: a) to define an apparatus as a system of relations that can be established between a set of component elements made up of a ‘heterogeneous ensemble consisting of discourses, institutions, architectural forms, regulatory decisions, laws, administrative measures, scientific statements, philosophical, moral and philanthropic propositions’; b) to identify the nature of the connection that can exist among those heterogeneous elements and how the interplay among those elements varies widely across time and space; and c) to describe an apparatus as a strategic formation in response to ‘an urgent need’ at a given historical moment (Foucault 1980: 194–195).

of a proposition (e.g., natural capital) on the ability to draw together a corresponding sociotechnical apparatus. Hardie and MacKenzie (2007: 59) effectively summarize Callon's (2007) point in their observation that 'a "statement" (a proposition, an equation, a model, a method, a tool . . .) can be made to work if the corresponding *agencement* can be constructed'. It is the construction of this *agencement* and the importance of that construction in the realization of 'natural capital' that allows us to envision the ways in which actors and agencies are drawn together over time to actualize 'natural capital' in the world.

Virtualism is a contested process that, like hegemony, is never complete — although it can be successful. Accordingly, making 'the world' conform to an image of itself is a long, messy and conflicted affair — one in which the constant work of orchestrating, aligning and articulating actors, interests, institutions and mechanisms must occur, and one in which turning fragile social ties (with a consequently weaker capacity to realize conformity) into durable associations (with a consequently stronger, if still temporary, capacity to realize conformity) is crucial (Latour, 2005). These durable associations do not have to be static. In fact their durability comes from their resilience in the face of constant change. What we highlight below is that these processes — the (re)construction of *agencements* — require performance and are also performative. We illuminate the importance of particular agencies, sites and spaces through which to witness the (re)construction of *agencements* essential for an understanding of virtualism (Hardie and MacKenzie, 2007; MacKenzie et al., 2007), and we situate TEEB as an actor constituted by and constitutive of a dynamic *agencement* that works to (re)produce and reify nature as an array of goods and services subject to costing.<sup>10</sup> TEEB, we argue, provides the institutional basis for creating and positioning markets as a privileged arbiter in the distribution of biodiversity and 'ecosystem services'.

Here we diverge from Carrier and West (2009: 9–10): it is irrelevant whether or not 'environmentalism contains totalising visions with virtualising tendencies'. There need not be complete meshing of the vision and its created reality for that vision to have effects. Those effects may be distant in time and space from the vision, as virtualizing tendencies take on a life of their own. Similarly, as virtualism is always contested, it can always be resisted. But what we are interested in here is how the process of virtualism shapes the terrain upon which resistance happens.

For virtualism to be successful 'virtual moments' need to be linked together through more and less intensive relations among, and the alignment

---

10. What TEEB is actually seeking to do is to *cost*, to bring what have been represented as externalities into a form of management accounting in which the use of biodiversity (including presumably the lost opportunity costs of its demise) can be included in the series of events that constitute the supply chain of any product.

of, actors situated differently across time and space, where in Miller's (2005: 10–11) words:

there exists a *longue durée* . . . and that this too has an agency that needs to be understood in terms of its own temporality and not just in terms of 'moments' as a presence in a given . . . analysis of specific interactions of agencements. . . . It is possible to write about the general history of virtualism and to carry out ethnography on the virtual moment. Either without the other is lacking.

While Callon is less comfortable with the implied determinism of a '*longue durée*', he recognizes the importance of temporality, describing the importance of detailed (ethnographic) attention to actor agencies and the spaces in which they meet as helping to understand the power struggles and asymmetry of resources that contribute to the hardening of identities and interests. Tracking multiple moments in the dynamic construction of agencement reveals how '[s]trength is the outcome of a long process of accumulation, weaving of alliances and relations, from micro-positions constructed first as little gaps or differences lodged in the interstices of existing configurations' (Callon, 2005: 18). Indeed it is the contestation, the fact that alliances and relations must be produced from within the messiness and contradictions of everyday life, that makes performance so important to an understanding of the construction of an agencement through which 'natural capital' becomes a model that has increasing control in the world. How is it that actors come to be part of 'a coordinated set of heterogeneous actors which interact more or less successfully to develop, produce, distribute, and diffuse methods for generating goods and services' (Callon, 1991: 133)? In what follows, we approach this question through ethnographic attention to a 'virtual moment' (Miller, 2003) in the production of natural capital — TEEB's presence at the field-configuring event CBD/COP10.

## **THE VIRTUAL MOMENT OF TEEB**

### **Natural Capital's Stage**

An outcome of the 1992 United Nations (UN) Earth Summit, the CBD entered into force in 1993 and has 191 Party members. At its biennial COP, these Parties come together to review progress, identify priorities, and establish work plans, as well as provide direction to the Global Environment Facility (GEF), which is the financial mechanism of the CBD, and the Subsidiary Body on Scientific, Technical and Technological Advice, which provides scientific advice to the CBD. COP meetings encompass: the formal plenary; two main working groups in which delegations state their positions on various decisions before the COP; break-out groups of smaller contact groups or friends of the chair sessions in which selected delegations negotiate

specific text for presentation to the working groups; 'side events', or topical workshops, often organized by NGOs and intergovernmental organizations; press briefings; and high-level, closed door meetings, open primarily to Parties.

The CBD, like all international agreements, is more than simply a document; it is an institution that calls into being an active political space — an arena in which rights and interests may be negotiated and new social relations configured around those negotiations (cf. Strathearn, 2000). This arena can lead to creative opportunities for new actors to claim authority, but it also creates a context in which privileged positions, perspectives and devices can be consolidated and codified in ways that structure policy and practice. In this manner, the COPs draw together actors with an explicit interest in biodiversity conservation, and configure power relations likely to mobilize material resources and institutional legitimacy in the continuing but shifting practice of biodiversity conservation. In addition to party delegates, such actors can include, but are not limited to, non-governmental organizations (NGOs), International Organizations (IOs), Intergovernmental Organizations (IGOs), representatives of indigenous communities and associations, private sector actors including the representatives of individual firms and trade associations, lobbyists, scientists, university intellectual property office representatives. To be institutionalized within the CBD is to have the sanction of states and to be articulated with related institutions such as the GEF. The presence of authoritative actors, who have the capacity to implement mechanisms through their respective organizations and personal contacts, helps to establish durable associations required for the realization of natural capital. Alignment and articulation, as ongoing processes, are key to the (re)production of those networks.

Because the work of producing conformity must, almost by definition, enlist dominant institutional mechanisms and actors, it is more publicly revealed in the particular moments and at particular sites (MacDonald, 2010a). Institutions like the CBD and events like COP10 create a stage on which projects like TEEB are performed, and, through orchestration, turn tenuous ties into more robust associations. They provide arenas in which the range of interests that constitute a major element of environmental politics today perform and communicate. In these moments of exposure, actors, normally dispersed in time and space, are drawn together. By observing the articulation, alignment and orchestration of biodiversity conservation actors and institutions in that process, we can deepen our understanding of the production of 'natural capital' as a virtualism. Importantly, this stage includes not only the continuing negotiations over the text of the convention: it allows 'stakeholders' to lobby member states and, through 'side events', demonstrate projects or experiences relating to the mandate of the CBD in ways that help to develop articulations among diverse actors, including parties and non-parties to the convention (MacDonald, 2010a).

While here we focus on one project — TEEB — at one meeting — CBD/COP10 — the perspective that informs this paper is based in rethinking the idea of the conventional field site. We understand the ethnographic ‘field’ of environmental governance to be not only multi-sited (Gupta and Ferguson, 1997; Marcus, 1995) but constituted by relationships among and within individual sites across space and time (Hannerz, 2003) — as a set of locales linked by actors drawn together and brought into association through transnational environmental governance, as well as the projects that it generates. Thus, our ‘sites’ in the conventional ethnographic sense, even as they are institutionally permanent and constitutionally mandated, are physically temporary, often appearing and disappearing according to statute or the organizational needs to convene actors over emerging matters of interest. It is this temporality that makes TEEB a moment in the virtualism of ‘natural capital’ and the site of COP10 an instance in that moment.

Studying this differentiated field requires a new approach. This reconfiguration means that ‘going to the field’ involves both attending these events and attending to the actors that move through them in time and space. It also positions the CBD/COP10 as a node in a network of events central to environmental governance ‘in which people, ideas and objects can be tracked to understand the ways in which they are orchestrated and configured’ (MacDonald, 2010a: 262). Moreover, CBD meetings of the Parties are large affairs, and thus impossible for a single observer to track a thematic thread through or observe comprehensively an entire meeting. To address this challenge, we use a methodological practice, ‘collaborative event ethnography’ (CEE) (Brosius and Campbell, 2010), which entails working as a multi-person team,<sup>11</sup> to mimic the ways in which official delegations distribute representatives across large international events. The work presented here is drawn in part from our involvement in a CEE of the CBD/COP10, which took place in Nagoya, Japan in October 2010. We draw on interviews and participant observation of COP10 official and informal events to examine the reconfiguration of power relations among key actors and the emergence, circulation, negotiation and stabilization of idealized categories of biodiversity, which subsequently serve as vehicles for the realization of ‘natural capital’. This focus on the event illuminates work that is often disaggregated in space or performed in bureaucratic sites resistant to direct observation (but see Corson, 2010; Mosse, 2006; Robertson, 2010).

---

11. This research was supported by the US National Science Foundation (award nos. 1027194 and 1027201). CEE relies on collaboration, in coordinating field work, collecting and analysing data, and thinking through meaning, and this paper reflects the efforts of the larger team working on site in Nagoya. The CBD/COP10 CEE team included: project leaders J. Peter Brosius, Lisa M. Campbell, Noella J. Gray and Kenneth I. MacDonald, and researchers Maggie Bourque, Catherine Corson, Juan Luis Dammert, Eial Dujovny, Shannon Hagerman, Sarah Hitchner, Shannon Greenberg, Rebecca Gruby, Edward M. Maclin, Kimberly R. Marion Suiseeya, Deborah Scott, Daniel Suarez and Rebecca Witter.

**The Virtual Reality of Natural Capital**

At the end of the formal presentation of TEEB to the parties to the CBD, as the applause was dying down and people were rising from their seats, a senior executive of a prominent UN agency leaned over to Pavan Sukhdev and, presumably not realizing that his microphone was still on, uttered the prophetic phrase 'TEEB begins now!'. An odd remark because TEEB as a project had been underway since 2007, it revealed that COP10 marked a critical turning point for TEEB. The transformation had multiple qualities: a) TEEB was being institutionalized as a component of the CBD; b) it was undergoing a metamorphosis from a study to an approach or a mechanism that would enable it to engage in performance and thereby draw more actors into its socio-technical network; and c) the results of its performance would create the conditions for the atomization and pricing of those 'services' of nature not currently commoditized, as well as their subordination to market exchange and speculative capital gains. To say that 'TEEB begins now' suggests a shared understanding that what had occurred before the COP meeting was simply preparing the ground for the 'real' work of TEEB.

As much as the performance of TEEB at COP10 can be analysed as a virtual moment, TEEB did not begin at COP10, or at Potsdam. Indeed, contrary to the currency that seems to be accorded to TEEB, it offers no new economic instruments: techniques such as green accounting and contingent valuation and calls to internalize externalities, even as they were contested, have long defined the competing fields of environmental and ecological economics (e.g., Costanza et al., 1997; Costanza and Daly, 1992; Daily, 1997; Ehrlich and Ehrlich, 1981; Pearce et al., 1989). In fact, a parsing of TEEB documents reveals a host of intellectual debts if not outright collateralized loans, which stretch back almost three decades. TEEB could not do the work of alignment and articulation — it could not be enacted — without an existing vision of 'natural capital' to serve as the focus of this exercise in conformity. It is this vision that TEEB repackages in an effort to circulate and popularize an expressed image of the environment as a reservoir of capital or 'nature conceived in the image of capital' (O'Connor, 1994: 131) — able to reproduce itself over time and space through the implementation of 'regimes of investment' integrated in 'a rational calculus of production and exchange' (Foster, 2002: 36).

Accordingly, it presents environmental problems as failures to account for or adequately value (i.e., price and cost) components of nature. 'The problem', in this vision, is not with capitalism as a system of socio-economic organization, nor with markets as the basis for exchange and distribution, but with a 'nature' that has not been adequately priced. In introducing TEEB at the CBD, Pavan Sukhdev described 'the problem' as nature that has been economically 'invisible', which TEEB sees as a shared problem, with a shared solution: 'The economic invisibility of nature must end... Governments must respond to the economic value of nature

by changing policies . . . Companies must respond to the value of nature by recognizing their externalities and adopting a different and more responsible forward behaviour'.<sup>12</sup> The solution, in accordance with this definition of 'the problem', is to make nature visible as capital so that it can become part of the 'rational system of commodity exchange' (Foster, 2002: 35). Accordingly, realizing 'natural capital' entails breaking the environment down into specific components — (ecosystem) goods and services — that can be alienated and brought into being as commodities, given an imputed price (TEEB would say a value) and subordinated to market mechanisms and policy instruments that use price as the basis for environmental protection.

While there may be little new in the economics that TEEB invokes, what is new is the purposeful alignment of particular actors — an authoritative managerial class<sup>13</sup> — brought together around it, the production of a visionary to serve as the embodiment of TEEB, and the calculated manner in which it has targeted key audiences. TEEB's institutional appeal lies in this sanction and the (re)packaging, (re)presentation and (re)distribution of ecological and environmental economics as a product — an ostensibly implementable package designed, in relation to techniques of governance, to avoid complexity (with consequent appeal to policy makers) and to easily adopt the reductionist managerial logics of 'best practices' that accompany the operation and regulation of markets. Notably, however, this appeal is enhanced through its embodiment in the form of a visionary with the capacity to enact particular forms of expertise (Carr, 2010). Sukhdev's position as a finance capitalist, rather than an economist, is important, for example because he represents a form of 'real world' expertise that qualifies him as distinct from the arcane world of economics, and already aligned with the decision makers that environmental organizations seek to access.

### **The Visionary**

Carrier and West (2009: 7) acknowledge the importance of this embodied presence when they point out that some agents are better placed than others to conform the world to a virtual vision, and they emphasize the importance of the visionary: 'the visionary must be powerful politically and the vision must be grounded in a form of knowledge production that is powerful socially . . . ' As the singular consistent embodied presence of TEEB, Pavan Sukhdev presented himself, and was produced, as a visionary for natural capital:

- 
12. TEEB press conference, 10th Conference of the Parties to the Convention on Biological Diversity, Nagoya, Japan, 20 October, 2010.
  13. This managerial class, or senior actors in conservation organizations, is distinct from, albeit intertwined with, the transnational capitalist class of corporate executives, bureaucrats and politicians, professionals, merchants and the mass media referred to in the critical neoliberal conservation literature that draws on Sklair (2001) (e.g., Holmes, 2010; Igoe et al., 2010; MacDonald, 2010b).

If you want to ask when the first glimmerings happened, it was when a friend of my wife's asked me: 'Why are some things worth money, and other things not?'. Economics treats . . . nature and its flows, its benefits, as externalities, and her question was very simple and very important . . . *I have kind of understood the issue, perhaps earlier than the average man on the street, and I just felt it was my duty to bring it out, to do as much work to develop this issue and understand why is it that we can't seem to account for what's valuable.*<sup>14</sup>

While these words position Sukhdev as a visionary, the production of a visionary also requires the sanction of other politically powerful actors. Where academic ecological economists failed to mobilize environmental institutions and organizations, Sukhdev has successfully directed the integration of their models into conservation institutions like the CBD, conservation NGOs, states and private sector actors. It is these actions that allowed the Director General of IUCN to claim, in one COP10 session 'Everyone knows you Pavan',<sup>15</sup> and Karl Falkenburg, Director General for Environment for the European Union to announce in another, 'The maestro of TEEB, Pavan Sukhdev is here . . .'.<sup>16</sup>

In many ways, the success of TEEB was tied to features that address the desire among CBD parties and other conservation organizations to engage with 'non-traditional' actors. Sukhdev's credentials as a 'conservation outsider' served to legitimate his expertise. As the UNEP media official stated: 'The success of TEEB is [that] we have someone like Pavan who's available all the time for press, for media, for interviews to get the message out, with the credibility of being a banker, right? He wasn't from an environmental NGO, so he wasn't part of the converted, although of course he has been converted'.<sup>17</sup>

As the TEEB visionary — the embodiment of expertise — recognized and sanctioned by a loose coalition of powerful actors, Sukhdev, through performance, was able to help shift the CBD in a new direction. During COP10, for example, as the prominence of TEEB became evident, side event titles changed, corridor conversations shifted, and high-level politicians struggled to reformulate their speeches in the language of ecosystem services and more specifically TEEB. Sukhdev appeared frequently on a variety of stages with other powerful actors, and his enactment of expertise and authority underpinned this capacity to achieve conformity — to enrol a wide range of actors across the event and beyond it, across networks that spanned private,

---

14. 'Dr Pavan Sukhdev on "The Invisible Economy"', Youtube Channel of Corporate Knights: The Canadian Magazine for Responsible Business: [http://www.youtube.com/watch?v=VZWnMaX\\_bsY](http://www.youtube.com/watch?v=VZWnMaX_bsY) (accessed 3 July 2011). Sukhdev is widely distributed in video as the face of TEEB.

15. 25 October 2010, Side Event, 'The Value of Ecosystems and Biodiversity to the Economy, Society and Political Decision making: The TEEB Approach for Policy Makers'.

16. 25 October 2010, Side Event, 'High Level Plenary Meeting on Economic value of Biodiversity'.

17. Nick Nuttal, 'TEEB 4 Me: Communicating the Value of Nature,' Side Event, 25 October 2010, Nagoya, Japan.

non-profit and public sectors. In a perverse way, Sukhdev's 'conversion' to the environmental cause creates the pathway through which environmentalists can in turn convert to the economic cause as he represents a promise, through alignment and articulation with the project he embodies, of access to a world of decision making (and resources) previously poorly accessible or inaccessible to many environmentalists.

Ultimately, TEEB cannot perform, cannot become part of the agencement and cannot do the work of realizing the virtual reality of 'natural capital' without the voice(s), like Sukhdev's, that lend it the sanction of expertise and authority, the stage(s) upon which to enact expertise, and the audiences for whom to perform. This is what makes virtual moments like TEEB and instances like COP10 integral to, and integral to understanding, the production and legitimation of 'natural capital'.

#### **THE ALIGNMENT, ARTICULATION AND ORCHESTRATION OF TEEB: FROM STUDY TO APPROACH**

As TEEB grew from its origin as a proposal at the Potsdam G8 meeting in 2007 to an initiative, a study, and ultimately an approach, its structure took on new shape as various qualities and properties were used to align and articulate these different sets of actors. In fact, TEEB's capacity to generate alignment and articulation during COP10 was built on an existing institutional calculus put in place long before the meeting. The TEEB team had to bring together people with access to diverse sectors (e.g., politics, business, science, governance) and distinct sources of credibility. They had to design mechanisms for the circulation of information among individuals contributing resources to support the project and they had to develop modes of communication that could differentiate among these interests while maintaining some degree of unified intent. As a result, in the words of one COP10 presenter, 'people attending the COP are already convinced about ecosystem services'.<sup>18</sup> The shape of TEEB is not related so much to the explanatory power of ecological economics as it is to the specification of qualities and properties which come into being and are modified in relation to the development of the network (Mitchell, 2008). The best evidence of this calculus lies in the composition of TEEB's fifteen-member advisory board which includes key organizational leaders, such as UNEP Executive Director Achim Steiner and IUCN Director General Julia Marton Lefevre, together with leading ecological and environmental economists, such as Joan Martinez-Alier and Ed Barbier, and Nicholas Stern, the author of the climate change Stern report. Through the alignment of key academic and

---

18. COP10 Side Event, 21 October 2010, 'TEEB – The Economics of Ecosystems and Biodiversity: Examples of Best Valuation Practice from Japan and National Policy Findings and Options'.

policy leaders, its embrace of so-called epistemic pluralism and a diversity of economic instruments (Monfreda, 2010), TEEB disembedded economic and policy expertise from their disciplinary and organizational confines and re-articulated them as allies in a common struggle.

Perhaps the clearest evidence of this is in the project's initial output. By COP10, for example, it had released five reports/websites, which even as it worked to unify them, targeted different audiences: 'TEEB for Ecologists and Economists'; 'TEEB for Business'; 'TEEB for National and International Policy Makers'; 'TEEB for Local and Regional Policy', and a website for 'citizens', entitled Bank of 'Natural Capital',<sup>19</sup> as well as a report that synthesized the TEEB approach, conclusions and recommendations. Unabashed about its intentions, the synthesis report (TEEB, 2010: 4) states, 'TEEB seeks to inform and trigger numerous initiatives and processes at national and international levels'. It goes on to list various targeted processes and venues including the G8 + 5 and the G20; the Millennium Development Goals; the 2012 'Rio + 20' Earth Summit; UN efforts to mainstream the environment in financial services; the Organization for Economic Cooperation and Development (OECD) responsible business conduct Guidelines for Multinational Enterprises; and industry voluntary guidelines. By the end of the 10th COP, as Brazil and India announced national TEEB initiatives, the project of institutionalizing TEEB through its incorporation into national environmental planning and accordant demonstration projects had begun.

But the most striking evidence that TEEB is to become a key mechanism in state environmental planning and is likely to become a key 'tool' in GEF's funding arrangements is found in several key recommendations taken in inter-sessional meetings of the CBD in preparation for COP10. From the May 2010 14th meeting of the SBSTTA, six key recommendations related to Protected Areas, Sustainable Use of Biodiversity, and Incentive Measures explicitly advised parties and multilateral financial institutions including the GEF to look to TEEB for guidance in developing and implementing 'additional means and methods of generating and allocating finance, inter alia on the basis of a stronger valuation of ecosystem services'.<sup>20</sup> Two recommendations from the Ad Hoc Open-Ended Working Group on Review of Implementation of the Convention direct the Executive Secretary of the CBD to extend TEEB by working with UNEP, the World Bank and the Organization for Economic Cooperation and Development (OECD) to further develop 'the economic aspects related to ecosystem services and biodiversity', develop 'implementation tools for the integration of the economic case for biodiversity and ecosystem services', and facilitate 'implementation and capacity-building for such tools'. They also directed the Secretariat to develop 'capacity-building workshops, to support countries in making

---

19. See <http://bankofnaturalcapital.com/>

20. SBSTTA 14-XIV/4 (c) 8: <http://www.cbd.int/recommendation/sbstta/?id=12251> (accessed 10 June 2011).

use of the findings of the TEEB study and in integrating the values of biodiversity into relevant national and local policies, programmes and planning processes'.<sup>21</sup>

### THE DISTRIBUTED PRESENCE OF TEEB AT COP10

With these alignments in place, the use of COP10 to stage the rollout of TEEB attracted the attention and resource investments of potential affiliates, including politicians, scientists, businesses, bureaucrats and activists, among others. Within the confined space of a Congress Centre and over a concentrated time of ten days, TEEB's distribution system (which included an effective media communications strategy) was able to reach the major influential actors across a range of ideological perspectives involved in biodiversity conservation, encourage alignment, and publicize what was no longer described as a study but as an approach. Unlike in previous meetings (MacDonald, 2010a, 2010b), the discourse of 'natural capital' was not restricted to parochial discussions of economic incentives. Instead, TEEB was well integrated across streams making it difficult for any particular interest group to ignore. The heads of both UNEP and the CBD Secretariat highlighted TEEB in the opening ceremonies, and it was a key presence in sessions devoted to ecological modelling, climate change, sustainable use and parliamentary decision making, among others. In other words, it was widely distributed, widely promoted and widely accessible.

That large plenary rooms — spaces in which large audiences could congregate — were reserved at particular times for TEEB related presentations, and that TEEB presentations were integrated into sessions organized by influential actors across the meeting indicated the intensity of the *work* that had gone into configuring a TEEB *network* prior to COP10 with the specific intent of foregrounding it during the meeting. How to set the stage(s); when and where the event(s) should be performed; what related actors should be included on what stages; which scripts should be used for what audience(s) to communicate what message(s); with what effect(s) or intent(s), toward what end(s)? Resolving these questions produces orchestration. It relies upon associations with event planners or sponsors who have the capacity to not only 'direct' through the arrangement of presentation spaces, but also to integrate certain perspectives into a programme in ways that achieve visibility and presence for that perspective. These associations, established well in advance of the meeting, enabled TEEB to have a distributed presence at COP10 so that the performance of TEEB could occur in front of a diversity of audiences. By observing and tracking the distributed presence of TEEB

---

21. UNEP/CBD/WG-RI/3/L.9 — 'Updating and Revision of the Strategic Plan for the Post-2010 Period' 28 May 2010. See [www.cbd.int/doc/meetings/wgri/wgri-03/in-session/wgri-03-l-09-en.pdf](http://www.cbd.int/doc/meetings/wgri/wgri-03/in-session/wgri-03-l-09-en.pdf)

during COP10, we could observe TEEB as a political project — an agencement that extends beyond its intellectual substance — and watch virtualism unfold in practice as actors aligned and articulated with TEEB not simply by sheer force of material domination but through appeals to particular interests. And even though those appeals were tailored to distinct audiences, the distributed presence of TEEB at COP10 was aimed at communicating a central message: the need to adopt and circulate a calculus, metric and mechanism with the capacity to convince decision makers of the 'reality' and 'value' of natural capital.

### **TEEB AND THE LEGITIMATION OF 'NATURAL CAPITAL'**

TEEB applies conventional practices of cost accounting to an 'invisible' nature, simultaneously enabling other 'market mechanisms' (e.g., PES, biodiversity offsets). As such, TEEB steps in to occupy sacred quantitative ground — to provide the value determinations that 'markets' and 'payments' and 'property swaps' require to be inserted into legal regimes of contractuality and moral spheres of equitable exchange. In this practice of accounting — or valuation — we enter the domain of Latour's metrology (1987: 15), in our case the making of nature as a regime 'inside which facts can survive'.

The number as representation simultaneously holds and issues an appeal. It is discrete, easily subject to the algorithmic needs of models, and communicates the authority of an imagined objectivity. But what the number appeals to is distinct from (though integrally related to) the appeal that the number holds. In the latter case it attracts through its capacity to legitimate and to make actors, and their interests, needs and responsibilities visible, with all of the accordant gains that visibility generates. In explaining their articulation with TEEB at COP10, for example, modellers spoke of an opportunity for their models to have a policy impact; activists/environmental groups saw an opportunity to use TEEB to reach policy makers and make them see 'how the world really is', and Ministers of Environment sought an opportunity to demonstrate to Ministers of Finance that biodiversity does have a 'value' figure that can be incorporated in national accounts. Barry Gardiner, former Junior Minister in the UK Department of Food, Environment, and Rural Affairs (one of the primary sponsors of TEEB) and now an opposition MP and a Vice-President of GLOBE International, an association of global legislators, and the lead of their 'natural capital' initiative, summarized his successful presentation to the Minister of Finance with precise figures of how much biodiversity contributes to production: 'In my budget I had 6 million pounds to address fungal diseases in honey bees. The Finance Department said get rid of it and I said I could but it would cost 190 million pounds. They asked why and I explained the effect of fungal diseases on pollination and the cost

of decline in yields — which had been quantified by our national accounts office — I got my 6 million pounds'.<sup>22</sup>

Much of this appeal of the number is bound to the authority granted to economics and cost-benefit analysis, but it is also related to how shifts in the context of environmental decision making as practices of neoliberal governance have subordinated ecological rationales to economic rationales. Yet, these rationales also demonstrate that the intellectual apparatus behind the number with all its assumptions and calculations is incidental. Its power to convince is what really matters. As the Head of UNEP Media reflected, 'TEEB's gone from . . . a kind of interesting subject for environmental correspondents, to one now where business correspondents and the politicians are getting the message. One [reason] of course is the numbers. Sheer numbers make one sit up in bed, don't they?'.<sup>23</sup> Like technologies of visualization, such as maps, models and narratives designed to make nature legible (Scott, 1998) and visible (Brosius, 2006; Forsyth, 2003), numbers create nature as understandable and approachable for policy makers and thus mechanisms for remaking reality. By packaging a series of numbers — e.g., 'Conserving forests avoids greenhouse gas emissions worth US\$ 3.7 trillion' and 'Global sales of organic food and drink have recently been increasing by over US\$ 5 billion a year, reaching US\$ 46 billion in 2007' (TEEB, 2010: 8) — TEEB appealed to policy, business and public audiences not only to support conservation, but to help *create* the conditions for the emergence of a market for ecosystem services.

It is the claims made on behalf of numbers, and the sanctioning effect of those claims, that give us insight into TEEB's primary claim, which is a moral one. TEEB leadership carefully crafted a message to seek 'win-win-win' solutions, which would simultaneously encompass the environment, economy and people. The constant refrain across TEEB sessions of nature being the 'GDP of the poor' positioned TEEB, accounting, and the pricing of nature as projects that served the interests of 'the poor'. Sukhdev argued, 'The central concern of TEEB is that the economic invisibility of nature has . . . exacerbated the suffering of human beings, especially those at the bottom of the economic pyramid . . . That is the biggest finding that TEEB has to present to you today'.<sup>24</sup>

In this explicit calculation designed to appeal to development practitioners as well as conservationists, TEEB has become another moment in conservation's long struggle to become relevant to development. Like many such efforts, it endeavours to illustrate how, via its commodification,

22. COP10 Side Event, 27 October 2010, 'GLOBE International: Legislative Approaches to Recognizing the Value of Biodiversity and Natural Capital'.
23. COP10 Side Event, 25 October 2010, on 'TEEB 4 Me: Communicating the Value of Nature'.
24. TEEB press conference, 10th Conference of the Parties to the Convention on Biological Diversity, Nagoya, Japan, 20 October 2010.

conservation can become compatible with poverty reduction (Büscher, 2010). This utility of 'the poor' in the promotion of the financialization of biodiversity is instrumentalist at root. In terms of degradation, biodiversity loss is greatest in areas subject to industrialization and urbanization and that in fact is where we find the majority of the world's poor — those without access to land and without access to clean water or air. It ignores the fierce and often violent battles over property and property rights that market mechanisms open up, and appeals instead to social justice as a moral quantity best pursued and distributed through the market. In making nature visible and legible, the number abstracts and decontextualizes socationature, and subsequently re-embeds it in society (McAfee and Shapiro, 2010), translating socio-ecological characteristics into a 'nature' that capitalism 'can see' (Robertson, 2007).

The crucial moral appeal of TEEB, however, lies in implicit assumptions about rationalism and policy making. During COP10, Pavan Sukhdev was fond of saying: '[e]conomics at the end of the day is the currency of policy and it's important to get the economics right. But economics at the same time is only weaponry. The direction in which you shoot is an ethical choice'.<sup>25</sup> The reliance of TEEB on rationalism for its own legitimation is readily apparent: 'Understanding and capturing the value of ecosystems can lead to better informed . . . decisions; accounting for such value can result in better management; investing in 'natural capital' can yield high returns; and sharing the benefits of these actions can deliver real benefits to those worst off in society' (TEEB, 2009: 3). Indeed, Sukhdev frequently repeats a phrase from management school texts: 'What you do not measure, you do not manage'.<sup>26</sup> Trite as this sounds it is significant since it frames the question of legibility, or the way in which a world (i.e., nature) comes into being through the production and accumulation of 'facts' about that world.

Ironically, these comments are grounded in a crucial assertion that 'business', and more problematically government, have not been acting rationally — that in allowing the degradation of ecosystems and biodiversity, they have been undermining the capacity to accumulate wealth. Yet, rather than see this problem as malignant — as a contradiction of capitalism — it is viewed as a function of not having the right 'information'. As such, these are also claims regarding the morality of metrics — as if to say that what is fixed quantitatively can be acted upon qualitatively — if policy makers had the right (quantitatively correct) information, they would make the right (qualitatively correct — i.e., moral) decisions, and that rational decisions cannot be made in the absence of 'the right' information.

---

25. TEEB press conference, 10th Conference of the Parties to the Convention on Biological Diversity, Nagoya, Japan, 20 October 2010.

26. This phrase has been repeated so frequently by Sukhdev that, despite the fact that it has been circulating for decades, some people in the conservation world have begun to attribute it to him.

**POST-CBD/COP10**

Since the rollout of TEEB at COP10 in October 2010 it has rapidly circulated through subsequent meetings related to biodiversity. A case in point was the January 2011 Symposium on Caribbean Marine Protected Areas, held in Guadeloupe, where a representative of Fonds Francais pour l'Environnement Mondial, Paris (the French focal point for the GEF) referred to 'Nagoya, where a major event was the publication of a study of the valuation of ecosystems [TEEB], made public during the convention', and the moderator introduced TEEB to the assembled audience of protected area managers, academics, and state and NGO representatives as 'the international bible of socioeconomic assessment'.<sup>27</sup> The biblical status that TEEB seems to have earned so quickly reflects the shifting ideological and material landscape of biodiversity conservation where a new 'reality' — a new ontology — is being brought into being by reordering relations of power around the ideological project of 'accounting for nature' and the political project of convincing business and policy makers that nature is valuable because it can be priced (see also MacDonald, 2010a).

In this sense, TEEB, as a moment and mechanism in virtualism, is part of the larger political project of the green economy. Büscher (2009: 92) argues that 'conservation in a hypercompetitive, neoliberal public domain increasingly needs to broaden its constituencies and thematic reach in order to remain legitimate'. It is in that vein that TEEB offers a mechanism by which to reformulate and rearticulate conservation ideology and practice as a component of the new green economy. Poised to supersede sustainable development as a hegemonic project to align environmentalism and neoliberalism, the concept of the green economy will be the focus of the 2012 UN Conference on Sustainable Development (otherwise known as Rio+20). Defined by UNEP as an 'economic system that recognizes the properties of healthy ecosystems as the backbone of economic and social well-being and as a precondition for poverty reduction' (Steiner, 2010: 844), the green economy is ideologically and institutionally intertwined with TEEB. UNEP hosts both TEEB and the Green Economy Initiative, and Pavan Sukhdev has headed both initiatives; panellists at the CBD repeatedly invoked TEEB as a way to realize the green economy; and a number of sessions at COP10 aimed specifically at influencing the Rio+20 agenda treated TEEB as an ostensible mechanism. For example, sessions sponsored by GLOBE were designed to 'convene a group of legislators to put this [TEEB] into practice and develop a series of cases to scale up the focus on natural capital, extend it across parliaments and be ready to operationalize by Rio in 2012'.<sup>28</sup>

---

27. We are grateful to Noella Gray, University of Guelph, for allowing us to use her notes of this encounter.

28. Adam Matthews, General Secretary, GLOBE International, Nagoya, 27 October 2010.

**CONCLUSION**

'So, as nature has changed in human eyes, the ways that we deal with nature and each other has changed as well' (Carrier and West, 2009: 1).

Bringing the world into being as 'natural capital' is an ongoing and dynamic exercise in virtualism — the process through which 'reality' is made to conform to virtual reality — where TEEB is a moment in the *longue durée* of the virtualism of natural capital; a key step in conforming image to reality. However, describing the emergent implications of that moment requires a capacity to situate it as an agencement that maps the heterogeneous ensemble of actors, institutions and devices (the apparatus) engaged in the production of natural capital, and the dynamic and contested relations among them.

Carrier and Miller argue that 'what distinguishes economic abstraction is the combination of its institutional power and its tendency to slip into virtualism. This is the conscious attempt to make the real world conform to the virtual image, justified by the claim that the failure of the real to conform to the ideal is a consequence merely of imperfections, but is a failure that itself has undesirable consequences' (Carrier and Miller, 1998: 8). We do not disagree with this but our analysis of TEEB suggests three modifications. 1) The institutional power Carrier and Miller highlight does not precede virtualism but is also brought into being as virtualism realizes some measure of 'success'. 2) Virtualism is not something that is slipped into. The 'slip' is a march — it is orchestrated, structured, scripted and contested. Virtualism is achieved through performance that facilitates the reproduction of an agencement (i.e., the articulation and alignment of actors, institutions, devices, technologies and methodologies) (Hardie and MacKenzie, 2007). 3) Actors know they are engaged in performance and acts of articulation and alignment.

Our point here is that while virtualism begins with an ideological commitment, it must also be achieved through virtual moments that are linked together in an ongoing process of reproduction grounded in conditions of contestation. It relies on processes of alignment and articulation that draw powerful actors together to subsequently enact that virtual reality with an aim to establishing durable associations in ways that institutionalize, and operationalize those models to convert abstractions into reality. It is through rendering a valued nature 'legible' (i.e., priced and costed) for key audiences that TEEB, as a component of natural capital, has been able to mobilize a critical mass of support ranging from modellers to policy-makers, parliamentarians, and bankers. In its acts of reducing the complexity of ecological dynamics to idealized categories, and, in claiming to be a quantitative force for morality, TEEB is engaged in the production and circulation of practices designed to conform the 'real' to the virtual. Understanding these acts of conformity requires attending to the spaces where the performance of this model and the 'facts' it produces are made apparent. The CBD is one such

site where the discursive strategies through which TEEB mobilizes the alignments and articulations required to overcome obstacles to the realization of 'natural capital' are readily apparent.

Indeed it is these alignments and articulations that are a condition of TEEB's production. Contrary to what proponents would assert, it is the network of attached actors that is TEEB, not the substance. As we pointed out above, the ideas contained in the TEEB study — the substance — are not new. What is new is the packaging, its attendance to specific audiences, the assemblage (institutional conditions) that contribute to its prominence, the capacity of those conditions and the presence they provide to draw actors to the package. TEEB is more than simply an ostensible product 'for sale' — or as Pavan Sukhdev frequently repeated, 'a gift' — it is a packaged good (containing premises, assumptions, models and predictions) that is intentionally networked and articulated with a broader group of actors and devices.

It would be an overstatement, however, to exaggerate the possibility of such calculation, for as projects like TEEB become dominant — as they are institutionalized and as the social ties that gave them birth are converted into more durable associations — choice is constrained and articulation becomes more likely, especially if smaller actors seek to retain legitimacy within the network of institutional environmental governance, and perhaps more importantly if they seek to continue to secure funding through dominant actors within that network (MacDonald, 2010b). As we witnessed during COP10, sanctioning TEEB as a core mechanism of the CBD is one way to lend it institutional coherence and to mobilize alignment and subsequent articulations.

While we have restricted much of our analysis to a particular project in the production of natural capital, it is important to highlight the relations between the processes of alignment and articulation that we have described here and how they reflect the containment of an effective oppositional politics and the very possibility of imagining natural capital. In a recent volume on virtualism in conservation projects, Carrier and West (2009: 1) recognize environmentalisms as different kinds of 'ways of thinking' which 'intersect with the world and people in it' and, consequently, the ways in which people identify and evaluate their natural surroundings, but they give fleeting mention of the ways in which environmentalism has become a vehicle that operates in the interests of capital accumulation and a vessel to be claimed in the legitimation of distinct projects. Once seen as a singular and distinct threat to accumulation, 'environmentalism' has become in practice a politics that can be enlisted, contained and directed to the interests of capital accumulation (Corson and MacDonald, nd).

TEEB is indicative of this process. Its rhetoric of crisis and value underpins a larger political project that aligns capitalism with a new kind of ecological modernization in which 'the market' and market devices serve as key mechanisms in practical efforts to conform the real and the virtual. The

consequences of this, however, are material and have been expressed by others who have described how the ascendance of neoliberal conservation has shifted the locus of decision making in international conservation (Corson, 2010; MacDonald, 2010b). TEEB is a step in this process, legitimating the market as the means through which biodiversity is conceived, stabilized and exchanged; the realm in which economic rationale, in realizing new forms of accumulation, displaces, or becomes indistinguishable from, ecological rationale. Within this realm the financial modelling of nature provides critical new investment opportunities, and the construction of environmental services as commodities opens them up to speculative behaviour, as calls for internalizing environmental externalities are transformed into the 'optimistic embrace of the returns that might be captured if this "value" of environmental externalities can be priced and traded' (Sullivan, 2011: 7). We argue that TEEB is playing an important role in legitimating and circulating the narratives, images and ideas of nature essential to these new speculative nature markets.

As projects like TEEB become instruments for capital expansion, they become agents of nature's restructuring, underpinning what Bram Büscher (2011) calls 'one of the biggest contradictions of our times': the idea that nature can be conserved by increasing capital circulation. Increasingly modes of conforming reality with the image of 'natural capital' circulate in popular culture and the daily economy of life. As travellers purchase carbon offsets to assuage the 'guilt' of flight, and as school children come to understand trees first and foremost as services in the reproduction of capital accumulation, we move closer to that contradiction, embodied in the virtualism of natural capital.

## REFERENCES

- Brockington, D. and R. Duffy (2010) 'Capitalism and Conservation: The Production and Reproduction of Biodiversity Conservation', *Antipode* 42(3): 469–84.
- Brosius, J.P. (2006) 'Seeing Communities: Technologies of Visualization in Conservation', in Gerald Creed (ed.) *Reconsidering Community: The Unintended Consequences of an Intellectual Romance*, pp. 227–54. Santa Fe, NM: School of American Research Press.
- Brosius, J.P. and L. Campbell (2010) 'Collaborative Event Ethnography: Conservation and Development Trade-Offs at the Fourth World Conservation Congress', *Conservation and Society* 8(4): 245–55.
- Büscher, B. (2009) 'Letters of Gold: Enabling Primitive Accumulation through Neoliberal Conservation', *Human Geography* 2(3): 91–93.
- Büscher, B. (2010) 'Derivative Nature: Interrogating the Value of Conservation in "Boundless Southern Africa"', *Third World Quarterly* 31(2): 259–76.
- Büscher, B. (2011) 'Nature on the Move: The Emergence and Circulation of Liquid Nature and Fictitious Conservation'. Paper presented at 'Nature™ Inc? Questioning the Market Panacea in Environmental Policy and Conservation', International conference ISS, The Hague, The Netherlands (30 June–2 July).
- Çalışkan, K. and M. Callon (2009) 'Economization, Part 1: Shifting Attention from the Economy towards Processes of Economization', *Economy and Society* 38(3): 369–98.

- Çalışkan, K. and M. Callon (2010) 'Economization, Part 2: A Research Programme for the Study of Markets', *Economy and Society* 39(1): 1–32.
- Callon, M. (1991) 'Techno-economic Networks and Irreversibility', in J. Law (ed.) *A Sociology of Monsters? Essays on Power, Technology and Domination*, pp. 132–61. London: Routledge.
- Callon, M. (1998) 'Introduction: The Embeddedness of Economic Markets in Economics', in Michel Callon (ed.) *The Laws of the Markets*, pp. 1–57 Oxford: Blackwell.
- Callon, M. (2005) 'Why Virtualism Paves the Way to Political Impotence: A Reply to Daniel Miller's Critique of the Laws of the Markets', *Economic Sociology* 6(2): 3–20.
- Callon, M. (2007) 'What Does it Mean to Say that Economics is Performative?', in D. MacKenzie, F. Muniesa and L. Siu (eds) *Do Economists Make Markets? On the Performativity of Economics*, pp. 311–57. Princeton, NJ: Princeton University Press.
- Callon, M. and K. Çalışkan (2005) 'New and Old Directions in the Anthropology of Markets'. Paper prepared for the Wenner-Gren Foundation for Anthropological Research, New York.
- Carr, E.S. (2010) 'Enactments of Expertise: Annual Review of Anthropology', *Anthropology* 39(1): 17–32.
- Carrier, J.G. and D. Miller (eds) (1998) *Virtualism: A New Political Economy*. Oxford: Berg Publishers.
- Carrier, J. and P. West (eds) (2009) *Virtualism, Governance and Practice: Vision and Execution in Environmental Conservation*. New York: Berghahn Books.
- Castree, N. (2008) 'Neoliberalising Nature: The Logics of Deregulation and Reregulation', *Environment and Planning A* 40(1): 131–52.
- Corson, C. (2010) 'Shifting Environmental Governance in a Neoliberal World: US AID For Conservation', *Antipode* 42(3): 576–602.
- Corson, C. and K. MacDonald (n.d.) 'Enclosing the Global Commons: The Convention on Biological Diversity and Green Grabbing', under review, *Journal of Peasant Studies*.
- Costanza, R. and H. Daly (1992) 'Natural Capital and Sustainable Development', *Conservation Biology* 6(1): 37–46.
- Costanza, R. et al. (1997) 'The Value of the World's Ecosystem Services and Natural Capital', *Nature* 387(1): 253–60.
- Daily, G.C. (ed.) (1997) *Nature's Services: Societal Dependence on Natural Ecosystems*. Washington, DC: Island Press.
- Ehrlich, P.R. and A.H. Ehrlich (1981) *Extinction: The Causes and Consequences of the Disappearance of Species*. New York: Random House.
- Forsyth, T. (2003) *Critical Political Ecology: The Politics of Environmental Science*. New York: Routledge.
- Foster, J.B. (2002) *Ecology Against Capitalism*. New York: Monthly Review Press.
- Foucault, M. (1980) *Power/Knowledge. Selected Interviews and Other Writings 1972–1977*. Colin Gordon (ed.). New York: Pantheon Books.
- Garcia-Parpet, M. (2008) 'The Social Construction of a Perfect Market: The Strawberry Auction at Fontaines-en-Sologne', in Donald MacKenzie, Fabian Muniesa and Lucia Siu (eds) *Do Economists Make Markets? On the Performativity of Economics*, pp. 22–50. Princeton, NJ: Princeton University Press.
- Gupta, A. and J. Ferguson (1997) *Anthropological Locations: Boundaries and Grounds of a Field Science*. Berkeley, CA: University of California Press.
- Hall, S. (1986) 'On Postmodernism and Articulation: An Interview with Stuart Hall', *Journal of Communication Inquiry* 10(2): 45–60.
- Hannerz, U. (2003) 'Being There . . . and There . . . and There! Reflections on Multi-site Ethnography', *Ethnography* 4(2): 201–16.
- Hardie, I. and D. MacKenzie (2007) 'Assembling an Economic Actor: The Agencement of a Hedge Fund', *The Sociological Review* 55(1): 57–80.
- Heynen, N., J. McCarthy, S. Prudham and P. Robbins (2007) *Neoliberal Environments: False Promises and Unnatural Consequences*. New York: Routledge.

- Holm, P. (2008) 'Which Way is Up on Callon?', in D. MacKenzie, F. Muniesa and L. Siu (eds) *Do Economists Make Markets? On the Performativity of Economics*, pp. 225–43. Princeton, NJ: Princeton University Press.
- Holmes, G. (2010) 'The Rich, the Powerful and the Endangered: Conservation Elites, Networks and the Dominican Republic', *Antipode* 42 (3): 624–46.
- Igoe, J., and D. Brockington (2007) 'Neoliberal Conservation: A Brief Overview', *Conservation and Society* 5(4): 432–49.
- Igoe, J., K. Neves and D. Brockington (2010) 'A Spectacular Eco-Tour around the Historic Bloc: Theorising the Convergence of Biodiversity Conservation and Capitalist Expansion', *Antipode* 42(3): 486–512.
- Latour, B. (1987) *Science in Action: How to Follow Scientists and Engineers through Society*. Cambridge, MA: Harvard University Press.
- Latour, B. (2005) *Reassembling the Social: An Introduction to Actor-Network Theory*. Oxford: Oxford University Press.
- Lohmann, L. (2009) 'Toward a Different Debate in Environmental Accounting: The Cases of Carbon and Cost–Benefit', *Accounting, Organizations and Society* 34: 499–534.
- MacDonald, K. (2010a) 'Business, Biodiversity and New "Fields" of Conservation: The World Conservation Congress and the Renegotiation of Organizational Order', *Conservation and Society* 8(4): 256–75.
- MacDonald, K. (2010b) 'The Devil Is In the (Bio)Diversity: Private Sector "Engagement" and the Restructuring of Biodiversity Conservation', *Antipode* 42(3): 513–50.
- MacKenzie, D. (2003) 'An Equation and its Worlds: Bricolage, Exemplars, Disunity and Performativity in Financial Economics', *Social Studies of Science* 33(6): 831–68.
- MacKenzie, D. (2007) 'The Material Production of Virtuality: Innovation, Cultural Geography and Facticity in Derivatives Markets', *Economy and Society* 36(3): 355–76.
- MacKenzie, D., F. Muniesa and L. Siu (2007) *Do Economists Make Markets? On the Performativity of Economics*. Princeton, NJ: Princeton University Press.
- Marcus G. (1995) 'Ethnography in/of the World System: The Emergence of Multi-sited Ethnography', *Annual Review of Anthropology* 24: 95–117.
- McAfee, K. and E.N. Shapiro (2010) 'Payments for Ecosystem Services in Mexico: Nature, Neoliberalism, Social Movements, and the State', *Annals of the Association of American Geographers* 100(3): 579–99.
- McCarthy, J. and S. Prudham (2004) 'Neoliberal Nature and the Nature of Neoliberalism', *Geoforum* 35(1): 275–83.
- Miller, D. (2003) 'The Virtual Moment', *Journal of the Royal Anthropological Institute* 9(1): 57–75.
- Miller, D. (2005) 'A Reply to Callon', *Economic Sociology* 6(3): 3–13.
- Mitchell, T. (2008) 'Rethinking Economy', *Geoforum* 39(1): 1116–21.
- Monfreda, C. (2010) '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', *Conservation & Society* 8(4): 276–85.
- Mosse, D. (2006) 'Anti-Social Anthropology? Objectivity, Objection, and the Ethnography of Public Policy and Professional Communities', *Journal of the Royal Anthropological Institute* 12(1): 935–56.
- O'Connor, M. (ed.) (1994) *Is Capitalism Sustainable? Political Economy and the Politics of Ecology*. New York: Guilford Press.
- Pearce, D.W., A. Markandya and E. Barbier (1989) *Blueprint for a Green Economy*. London: Earthscan.
- Robertson, M. (2007) 'Discovering Price in All the Wrong Places: The Work of Commodity Definition and Price Under Neoliberal Environmental Policy', *Antipode* 39(3): 500–26.
- Robertson, M. (2010) 'Performing Environmental Governance', *Geoforum* 41(1): 7–10.
- Scott, J.C. (1998) *Seeing Like a State: How Certain Schemes to Improve the Human Condition Have Failed*. New Haven, CT: Yale University Press.

- Sklair, L. (2001) *The Transnational Capitalist Class*. Oxford: Blackwell.
- Steiner, A. (2010) 'Focusing on the Good or the Bad: What Can International Environmental Law Do to Accelerate the Transition towards a Green Economy?', *American Society of International Law* 103(1): 3–14.
- Stern, N. (2007) *The Economics of Climate Change: The Stern Review*. Cambridge: Cambridge University Press.
- Sullivan, S. (2011) 'Banking Nature? The Financialisation of Environmental Conservation'. *Open Anthropology Cooperative Press*, Working Papers Series #8. <http://openanthcoop.net/press/2011/03/11/banking-nature/> (accessed 18 April 2011).
- TEEB (2009) 'The Economics of Ecosystems and Biodiversity for National and International Policy Makers – Summary: Responding to the Value of Nature'. [www.teebweb.org/LinkClick.aspx?fileticket=I4Y2nqqliCg%3D](http://www.teebweb.org/LinkClick.aspx?fileticket=I4Y2nqqliCg%3D) (accessed 11 June 2011).
- TEEB (2010) 'The Economics of Ecosystems and Biodiversity: Mainstreaming the Economics of Nature: A Synthesis of the Approach, Conclusions and Recommendations of TEEB'. <http://www.teebweb.org/TEEBSynthesisReport/tabid/29410/Default.aspx> (accessed 18 April 2011).

**Kenneth Iain MacDonald** teaches in the Department of Geography, Program in International Development Studies, and the Centre for Diaspora and Transnational Studies at the University of Toronto (Jackman Humanities Building, 170 St George St., Toronto, Ontario M5R 2M8, Canada). His current research brings an ethnographic approach to the study of transnational environmental governance. He can be contacted at e-mail: [ken.macdonald@utoronto.ca](mailto:ken.macdonald@utoronto.ca)

**Catherine Corson** is an Assistant Professor of Environmental Studies at Mount Holyoke College (50 College Street, South Hadley, MA 01075, USA). Her research focuses on neoliberal conservation, environmental governance, institutional ethnography, and political ecology. She has conducted ethnographic field research in Zimbabwe and Madagascar, and her recent work has been published in *Antipode* and *Society and Natural Resources*. Her e-mail address is: [ccorson@mtholyoke.edu](mailto:ccorson@mtholyoke.edu)