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Accounting for Nature: Risk, Uncertainty, and the Global Political Economy of the Ecological Crisis

Maechler Sylvain

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FACULTÉ DE SCIENCES SOCIALES ET POLITIQUES
INSTITUT D'ETUDES POLITIQUES

**Accounting for Nature: Risk, Uncertainty, and the Global
Political Economy of the Ecological Crisis**

THÈSE DE DOCTORAT

présentée à la

Faculté des sciences sociales et politiques de l'Université de Lausanne

pour l'obtention du grade de

Docteur en science politique

par

Sylvain MAECHLER

Directeur de thèse

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LAUSANNE, SUISSE

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LAUSANNE, SUISSE

2023



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Faculté des sciences
sociales et politiques

IMPRIMATUR

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- Monsieur Jean-Christophe GRAZ, Directeur de thèse, Vice-Doyen et Professeur à l'Université de Lausanne
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autorise, sans se prononcer sur les opinions du candidat, l'impression de la thèse de Monsieur Sylvain MAECHLER, intitulée :

**« Accounting for Nature :
Risk, Uncertainty and the Global Political Economy of the Ecological
Crisis »**

Nicky LE FEUVRE
Doyenne

Lausanne, le 31 janvier 2023

Abstract

Nature contributes to economic welfare. Yet, it is rarely recognised as such because it does not appear in market transactions. This, in any case, is the narrative underlying the proposal to integrate nature into accounting. This response to the ecological crisis, which, I suggest, aims to turn the uncertainty of the crisis into a quantified set of risks that can be mitigated or managed, is supported by a variety of international actors, including states, conservation organisations, businesses, and financial markets. Existing studies regularly discuss accounting for nature as if it was already a well-established practice. They either see it as a dangerous step towards the commodification of nature, or as a pragmatic way to include environmental concerns in decision-making processes. Instead of examining what accounting for nature could do if it was widely realised, this thesis analyses the different ways it is concretely discussed and developed, drawing on qualitative data including (participant) observations, interviews, and documentary analysis. Based on three articles, complemented by additional contextual background, theoretical discussions, and empirical findings, the thesis proposes a new analysis of three ways to account for nature developed chronologically and that still co-exist today: environmental accounting, natural capital accounting, and accounting for nature-related risks. Drawing on a global environmental political economy approach, I examine how the project to account for nature emerged in the early 1980s, was widely disseminated in the 2010s, and is maintained and transformed today by new actors, notably financial accounting standard-setters. I show that accounting for nature has never been implemented in the form or on the scale intended and has not been able to mitigate or manage the risks of the ecological crisis. However, I argue that its effects are important. In its more recent manifestations, accounting for nature is reinforcing the power of private finance in the global politics of the ecological crisis, while generating a system of discourse and knowledge that subverts all exit strategies from the crisis into accounting and monetary valuation practices. These findings contribute to diverse scholarships, in particular in international political economy and global environmental governance regarding the power relations underpinning the highly debated transformation of economic and financial instruments in the age of ecological crisis.

Résumé

La nature contribue au bien-être économique. Pourtant, elle n'est que rarement reconnue comme telle parce qu'elle n'apparaît pas dans les transactions marchandes. Voici le discours qui sous-tend la proposition d'intégrer la nature dans la comptabilité. Cette réponse à la crise écologique, qui vise à transformer l'incertitude de la crise en un ensemble quantifié de risques à même d'être atténués ou gérés est soutenue par une variété d'acteurs internationaux, y compris des États, des organisations de conservation de la nature, des entreprises et des acteurs financiers. Les études existantes traitent généralement de la comptabilité de la nature comme s'il s'agissait d'une pratique établie. Elles la considèrent soit comme une étape dangereuse vers la marchandisation de la nature, soit comme un moyen pragmatique d'inclure l'environnement dans les processus décisionnels. Plutôt que d'examiner ce que la comptabilité de la nature pourrait faire si elle était largement mise en œuvre, cette thèse étudie les différentes façons dont elle est concrètement discutée et développée, en s'appuyant sur des données qualitatives comprenant des observations, y compris participantes, des entretiens, ainsi qu'une analyse documentaire. Sur la base de trois articles, complétés par des éléments contextuels, des discussions théoriques et des résultats empiriques supplémentaires, la thèse propose une nouvelle analyse de trois manières de comptabiliser la nature qui se sont développées chronologiquement et qui coexistent encore aujourd'hui : la comptabilité environnementale, la comptabilité du capital naturel et la comptabilité des risques liés à la nature. En s'appuyant sur une approche d'économie politique globale de l'environnement, la thèse examine comment le projet comptabiliser la nature a émergé au début des années 1980, a été largement diffusé dans les années 2010, et est maintenu et transformé aujourd'hui par de nouveaux acteurs, notamment les normalisateurs comptables financiers. Je montre que la comptabilité de la nature n'a jamais été mise en œuvre sous la forme ou à l'échelle escomptée et n'a pas été en mesure d'atténuer ou de gérer les risques de la crise écologique. Cependant, je soutiens que ses effets restent importants. Dans ses manifestations les plus récentes, la comptabilité de la nature renforce le pouvoir de la finance privée dans la politique globale de la crise écologique, tout en générant un système de discours et de connaissances qui subvertit toutes les stratégies de sortie de crise en pratiques comptables et d'évaluation monétaire. Ces résultats contribuent à divers champs d'études, en particulier dans le domaine de l'économie politique internationale et de la gouvernance globale de l'environnement, concernant les relations de pouvoir qui sous-tendent la transformation controversée des instruments économiques et financiers à l'ère de la crise écologique.

“What we should not try to look for, because it does not exist and therefore cannot be found, is an all-embracing theory that pretends to enable us, even partially, to predict what will happen in the world economy tomorrow. The ambition in the social sciences to imitate the natural sciences and to discover and elaborate ‘laws’ of the international system, patterns so regular they govern social, political and economic behaviour, is and always has been a wild goose chase. [...] This is not to say that a social ‘scientist’ should not be as fiercely uncompromising in the search for truth as any physicist or geologist. But it is a different kind of truth and it is not best served by aspiring to the unattainable or promising that which cannot in the nature of things be delivered.”

Susan Strange, 1998, *States and Markets*. London: Bloomsbury Academic, p. 16.

“Sometimes it’s all about the win, sometimes it’s about the skiing.”

Bode Miller, unidentified source

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Acronyms

ACCA	Association of Chartered Certified Accountants
Big Four	Deloitte, EY, KPMG, PwC
BSI	British Standards Institution
CBD	Convention on Biological Diversity
CDSB	Climate Disclosure Standards Board
COP	Conference of the Parties
CSRD	Corporate Sustainability Reporting Directive
EBNS	European Business & Nature Summit
EFRAG	European Financial Reporting Advisory Group
EU	European Union
EU@BB	EU Business @ Biodiversity Platform
FSB	Financial Stability Board
GEG	Global environmental governance
GDP	Gross domestic product
GPE	Global political economy
GRI	Global Reporting Initiative
IASB	International Accounting Standards Board
IFRS	International Financial Reporting Standards
IMF	International Monetary Fund
IOSCO	International Organization of Securities Commissions
IPBES	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services
IPCC	Intergovernmental Panel on Climate Change
IPE	International political economy
ISAR	Intergovernmental Working Group on International Standards of Accounting and Reporting
ISO	International Organization for Standardization
IUCN	International Union for Conservation of Nature

MEA	Millennium Ecosystem Assessment
NASA	National Aeronautics and Space Administration
OECD	Organisation for Economic Co-operation and Development
PES	Payment for ecosystem services
SASB	Sustainability Accounting Standards Board
SDG	Sustainable Development Goals
SEC	United States Securities and Exchange Commission
SEEA	System of Environmental-Economic Accounting
SEEA-EA	System of Environmental-Economic Accounting – Ecosystem Accounting
SNA	System of National Accounts
STS	Science, Technology, and Society Studies
TCFD	Task Force on Climate-Related Financial Disclosures
TEEB	The Economics of Ecosystems and Biodiversity
UK	United Kingdoms
UN	United Nations
UNFCCC	United Nations Framework Convention on Climate Change
UNCEEAA	United Nations Committee of Experts on Environmental-Economic Accounting
UNESCO	United Nations Educational, Scientific and Cultural Organization
UNCTAD	United Nations Conference on Trade and Development
UNEP	United Nations Environment Programme
UNSC	United Nations Statistical Commission
UNSD	United Nations Statistical Division
US	United States
WBCSD	World Business Council for Sustainable Development
WEF	World Economic Forum
WRI	World Resource Institute
WWF	World Wide Fund for Nature

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1. Introduction

At the time of writing, one of the major events of global environmental governance, the Fifteenth Conference of the Parties to the UN Convention on Biological Diversity (COP 15), ended a few months ago in a relative state of ignorance. A number of media outlets have been questioning the fact that biodiversity is the poor relation of global environmental governance. In the *Financial Times*, internationally renowned natural resources economist Partha Dasgupta had his say: “biodiversity is such a complex issue that is hard to measure”. And because it is hard to measure, “nature’s processes are silent and invisible”¹. However, he thinks he has the solution: by measuring nature as an economic or financial asset, we can “communicate [the loss of biodiversity] with a simple idea”². As he explained in a recent report commissioned by the UK Treasury in preparation for the above-mentioned conference, “[o]nce we make that extension, the economics of biodiversity becomes a study in portfolio management” (Dasgupta, 2021, p. 4).

The *Financial Times*’s article continues by raising the good news at COP 15: “parts of the private sector are belatedly becoming engaged [by] trying to create nature-based corporate reporting systems”³, or what is referred to in this thesis as “accounting of nature”. The reasoning underlying the development of such accounting systems is that while nature contributes to economic welfare, it is rarely recognised as such because it does not come with prices attached to it: it does not “appear in the marketplace”, as again highlighted by Dasgupta⁴. Accounting

¹ Tett, Gillian. *Financial Times*. “Silence on biodiversity is deadly. Species are disappearing at an alarming rate and the economic consequences are catastrophic” (December 15, 2022). <https://www.ft.com/content/d24a44c2-79d9-47d7-914c-ee86cde89710> (accessed April 7, 2023).

² Ibid.

³ Ibid.

⁴ *Financial Times*. “It’s not a giant step to introduce nature into economics”. (November 3, 2022). <https://www.ft.com/content/4e623732-0b40-406a-af8b-0b01fdae3cab> (accessed April 7, 2023).

for nature would therefore compel economic actors to take nature into account in their decision-making process. This argument was already raised in the late 1980s, for instance in the context of a report again commissioned by the UK government to make the concept of sustainable development proposed in the landmark 1987 Brundtland report “actionable”, in preparation for the 1992 Rio Earth Summit: natural environments “have zero price simply because no market place exists in which their true value can be revealed through the acts of buying and selling” (Pearce, Markandya, & Barbier, 1989, p. 5).

For more than three decades, accounting for nature is thus proposed as a solution facing the global ecological crisis, including by a high number of states, a plethora of international organisations such as UNEP, the OECD, the World Bank, Eurostat, conservation organisations such as WWF or IUCN, major actors of the global political economy such as multinational firms, international banks, asset managers, consulting and accounting firms, and, more recently, financial accounting standard setters themselves, including the International Financial Reporting Standards (IFRS) Foundation, which already set financial accounting standards for almost the entire world. However, this strong support for accounting as a response to the global ecological crisis contrasts sharply with the lack of concrete implementation in this regard, as again recently put forward by international groups of experts (CBD, 2020; IPBES, 2022). **Why is nature still not accounted for as a response to the global ecological crisis despite the apparent international consensus on such a principle over more than thirty years?**

Existing studies regularly discuss accounting for nature as if it was already a common and well-established practice. They either see it as a dangerous step towards the commodification of nature (Dehm, 2023; Levidow, 2020; Sullivan & Hannis, 2017), as a further illustration of the hold of private actors on global environmental governance (Hiss, 2013; Thistlethwaite, 2015;

Thistlethwaite & Paterson, 2016), or, if well designed, as a pragmatic way to include a multitude of environmental concerns in decision-making processes. The latter scholarship literally creates new accounting frameworks, which nevertheless often remain at a (very) theoretical stage (Bebbington, Larrinaga, O'Dwyer, & Thomson, 2021; Feger et al., 2019). In all cases, the enduring disjunction between theory and practice is rarely emphasised, precisely because these studies do not look at how the subject is dealt with in practice.

Instead of examining what accounting for nature could do if it was widely realised, this thesis examines the different ways in which it is concretely discussed and developed by a variety of international actors in a variety of places, arenas, and institutions. Close to a “pragmatist anthropology”, my thesis “attempts to contribute to a sociohistory” of its object, “by following its actors” and “by (re)exploring the process of construction” of accounting for nature, from its emergence to its contemporary manifestations (Tornatore, 2019, my translation). I propose to see accounting for nature in the context of the enduring disjuncture between theory and practice in relation to the economisation and commodification of nature (Boisvert, 2016; Dempsey, 2016; Fletcher, 2023; Robertson, 2006), and with regard to the strategies of economic actors to ensure the fungibility of environmental concerns within capitalism (Bernstein, 2001; Clapp & Dauvergne, 2005; Paterson & Newell, 2010).

In addition to the above-mentioned starting question, this thesis explores in more detail the three following research questions:

- 1) **What is the relationship between accounting and the global ecological crisis? In other words, why is accounting for nature being developed?**
- 2) **How, by whom, and for whom is accounting for nature being developed?**
- 3) **What are the effects of accounting for nature on the global political economy of the ecological crisis?**

The thesis answers those questions through three articles, complemented by additional contextual background, theoretical discussions, and empirical findings. The first article of the thesis primarily addresses the first question. The other two articles contribute, in different ways, to answering the other two other research questions.

The first research question is thus addressed more particularly in the context of the first article of the thesis entitled *Is the Sky or the Earth the Limit? Risk, Uncertainty and Nature* (first published in 2020). In the contextualisation of this article (chapter 3), I suggest that the main challenge that international actors face in times of crisis is overcoming a state of uncertainty. In other words, they are faced with the challenge to decide and act in, or from, a state of uncertainty. Most often, the uncertainty of a crisis is dealt with by numbers and standardised procedures to generate them. This includes accounting, which helps to “objectify” uncertain events and phenomena. From this view, accounting for nature is thus developed to reduce the high level of uncertainty of the global ecological crisis. By distinguishing between epistemic and ontological levels of analysis, the first article of the thesis however argues that there are limits in the substitution of risk for uncertainty. This theoretical argument has empirical value. In line with critical accounting studies that have shown the political aspects of accounting, I suggest that no accounting method can offer a complete reduction of the uncertainty of the

ecological crisis. Instead, each accounting method proposes different political paths to reduce and deal with the uncertainty of the crisis.

The second research question is answered through further conceptualisation and empirical analysis. Throughout my research, I have identified, characterised and conceptualised three different ways of accounting for nature, which in effect propose different political paths to reduce the uncertainty of the ecological crisis. By drawing on Boltanski and Thévenot's concept of "common worlds" (1991), I have coined the one "accounting worlds". I distinguish and analyse three "accounting worlds for nature" that emerged at different periods of time, starting from the early 1980s: environmental accounting, natural capital accounting, and accounting for nature-related risks. Some have been at least partially eclipsed by others at some times, without completely disappearing. Today, these accounting worlds coexist without real competition or hierarchy – questions of relative visibility aside – and do not seem to be mutually permeable, insofar as each is highly situated. They share more differences than similarities, the only one being that they consider nature as a contribution to economic welfare, although the last one, accounting for nature-related risks, has a more restrictive interpretation. They are backed by different communities of actors, address different audiences, and do not always share the same political objective(s). While each of the three sketches out a framework for the regulation and governance of the relationship between capitalism and the environment, none has yet taken on the status of a hegemonic and exhaustive approach. For each of the three, I will answer the question of how, by whom, and for whom accounting for nature is being developed.

The first accounting world, that of environmental accounting, is expressed in biophysical, material and energy units, developed in a UN context by a self-proclaimed "statistical community". Through rules, procedures, and the scientific objectivity of statistics, it aims at

reducing the uncertainty of the ecological crisis through risk mitigation, i.e., the mitigation of environmental impacts. The second, that of natural capital accounting, is expressed in monetary units and developed by a variety of hybrid actors active in the international field of nature conservation, embodied into a self-proclaimed “natural capital community”. This accounting project is rooted in the visibility of nature through money, the incantatory narratives of “conservation celebrities” and the “spectacularisation of nature”. It has the same political objective of reducing the uncertainty of the ecological crisis through risk mitigation. Finally, the last accounting world, that of accounting for nature-related risks, is expressed in terms of financial risks and developed by financial analysts, accountants, and standard-setters. Unlike the other two, it aims to deal with the uncertainty of the ecological crisis not by mitigating the risks, but by managing them. Moreover, this accounting world, again unlike the other two, only takes into account the uncertainty of the crisis if it affects a particular audience, investors, and mainly with regard to climate change only – leaving aside, at least momentarily, the complexity of biodiversity and ecosystems.

Two of my articles engage specifically with one of these accounting worlds. The second article of my thesis, *Performing Natural Capital Accounting: A Dramaturgical Analysis* (accepted with minor revisions) is an empirical investigation of the contemporary embodiment of the second accounting world, that of natural capital accounting. In this article, I examine the way in which natural capital accounting is literally performed and spectacularised by the “natural capital community”, to the point that reality and fiction are intertwined when it comes to judging the proper implementation of this accounting world. Natural capital accounting, and particularly its embodiment in nature valuation, has become a hegemonic *discourse* in environmental conservation debates, without the same being true for the *practice* of nature valuation and natural capital accounting.

The last article of my thesis, *Accounting for Whom? The Financialisation of the Environmental Economic Transition* (first published in 2022), engages with the third accounting world, that of accounting for nature-related risks, exploring how financial accounting standard-setters are including environmental issues within their mandate, and are thus (currently) setting the related accounting standards. It shows how this project has reversed the long-standing assumption of accounting for environmental impacts, which involves risk mitigation, to focus exclusively on risk management – and risk management *for investors*.

Finally, what are the effects of accounting for nature on the global political economy of the ecological crisis? The answers to this question can also be found in the above-mentioned articles, complemented by additional theoretical discussions and empirical findings. I show that the uncertainty involved in the global ecological crisis remains largely unaddressed through accounting. The accounting worlds that have proposed to face such uncertainty through risk mitigation have until now failed to produce the expected outcomes. This does not mean that they have not had important effects. The second accounting world in particular, that of natural capital accounting, has generated a system of discourse and knowledge that subverts all exit strategies from the ecological crisis into monetary valuation practices. It reinforces hegemonic capitalist representations of nature on the one hand and thwarts the imagining of “other natures” on the other – a process which I propose to term “valuation-centrism”, from J.K. Gibson-Graham’s concept of capitalocentrism (2006). In contrast, the third accounting world, that of accounting for nature-related risks, backed by traditional accounting standard setters, seems more likely to become widespread, as it is supported by powerful actors of financial capitalism and allows them to maintain their existing frame of reference – financial risk management – while claiming to be at the forefront of environmental sustainability. Yet, if it proposes not to

mitigate, but only to manage the risks, it only does so for a specific audience, namely investors, which increases their power in the global politics of the ecological crisis. As will be further developed, these findings contribute to debates in international political economy and global environmental governance on the power relations underpinning the transformation of economic and financial instruments in the face of the global ecological crisis.

The overall thesis draws on and develops an interdisciplinary analysis underpinned by an international political economy (IPE) approach. As an approach, a field, a discipline, or a sub-discipline of international relations (the latter could also be termed as a sub-discipline of political science), IPE is born as interdisciplinarity thinking (Amin, Gills, Palan, & Taylor, 1994; Murphy & Tooze, 1991; Underhill, 2000). In one of the pioneer IPE textbooks, Palan (2000, p. 2) points out that from this perspective global political economy (GPE), rather than IPE, is a “frontiered discipline” whose main division lines “no longer trail International Relations’ controversies, but reflect broader issues and contemporary debates in political economy and the social sciences”. As discussed the same year by Graz (2000, p. 558), this proposition reflects a divide between an orthodox approach to IPE, which draws on the main assumptions of the realist school of international relations and adds to it the central assumptions of utilitarian economics, and heterodox approach, embodied into GPE, which aims at interdisciplinarity and theoretical syncretism⁵.

Montgomerie (2017b, p. 33) rejects even more clearly the term IPE which confines scholars to “a sub- set of a sub- discipline, a sub- set located at the margins of a more important discipline”,

⁵ Graz (2000) also notes that this divide has some geographical embodiment. While orthodox IPE is mostly reflected in US universities, heterodox approaches (or GPE) is mainly found in the UK and Canada. This has then been coined, conceptualised, and analysed as the “transatlantic divide” (Cohen, 2014; Cohen, 2007; Seabrooke & Young, 2017).

proposing instead “critical political economy as both a form of inquiry and a method of research”. By challenging this appellation of “sub-discipline”, Susan Strange, one of the founders of IPE, also provides a good definition of it:

“[t]he whole point of studying international political economy rather than international relations is to extend more widely the conventional limits of the study of politics, and the conventional concepts of who engages in politics, and *how and by whom power is exercised to influence outcomes*. Far from being a subdiscipline of international relations, IPE should claim that international relations are a subdiscipline of IPE” (Strange, 1994, p. 218, my emphasis).

The thesis engages in such GPE proposition to unveil “who benefits” from such or such accounting world for nature, more specifically embodied into the third research question.

I also draw on another “sub-field” of international relations, namely global environmental governance, and more specifically an IPE approach to global environmental governance. The latter suffers from similar issues as IPE, with orthodox and state-centric accounts focused on governance mechanisms, environmental regimes and institutions on the one hand, and interdisciplinary, “[c]ritical, often Marxist-inspired, accounts [that] have sought to address the question of capitalism’s (in)compatibility with the achievement of sustainability” on the other (Newell, 2008, p. 512). The thesis engages with and draws on the latter approach, which has known different labels over the years, such as “political economy of global environmental governance” (Newell, 2008), “international political economy and the environment (IPEE)” (Clapp & Helleiner, 2012), or, more recently, “global ecological political economy (GEPE)” (Katz-Rosene & Paterson, 2018). Although they may differ on some points, all of them try to develop a heterodox IPE (or GPE) approach to global environmental governance. All of them assume that global environmental governance is not only shaped by states, but by a number of public, private, and hybrid actors, including governments, but also international organisations,

NGOs, businesses, transnational coalitions, and plenty of other “sustainability professionals” and experts (Paterson & Newell, 2010; Thistlethwaite, 2017). Closely related, this thesis also draws inspiration from studies in political economy, political ecology, ecological economics, and economic geography, which have already underlined the critical disjuncture between theory and practice with regard to the economic valuation of nature and its promised commodification (Boisvert, 2016; Dempsey, 2016; Fletcher, 2023; Robertson, 2006).

The thesis mobilises and (re)interprets in the light of my empirical object diversity of concepts, most notably developed in the spheres of political economy, broadly understood, including Boltanski and Thévenot’s concept of “common worlds” (1991) from which I develop the one of “accounting world”; or J.K. Gibson-Graham’s concept of “capitalocentrism” (2006) from which I coin the one of “valuation-centrism”. As already mentioned, I also use the concepts of risk and uncertainty, for which I offer both an innovative theoretical interpretation based on existing literature in (international) political economy, and which I then mobilised empirically in relation to the objectives and effects of accounting for nature.

This thesis aims at making five contributions. The first contribution is to provide, to my knowledge, the first comprehensive empirical study of accounting for nature from this level of analysis. This goal is achieved without assuming, or anticipating, what accounting for nature might do if it was widely implemented, as has generally been the case to date. Instead, I focus on the concrete practices of actors developing such or such accounting methods for nature notably based on data derived from a variety of sources, including (participant) observations. It was by going to encounter the actors studied that I developed my research, my questions, and my arguments. This approach allowed me to have a precise understanding of the contemporary embodiment of my object, to understand its various – in time and place – “internal justificatory

repertoire[s]” (Muniesa, 2023, p. 170). This is through this dialectic between past and present that I (re)constructed my object in its variety and diversity. It allowed me to distinguish, and even more to conceptualise, the three “accounting worlds of nature”, named after the pragmatic sociology of Boltanski and Thévenot and their concept of “common worlds” (2006). I thus provide a comprehensive empirical study of accounting for nature that contrasts with the usually theoretical studies on this topic (Bebbington et al., 2019; Dehm, 2023), or/and with studies that have specifically explored one of the above-mentioned accounting worlds (see for instance Bérard, 2019 for the first; Levidow, 2020 for the second; and Thistlethwaite & Paterson, 2016 for the third).

Secondly, my thesis contributes to a cross-thematic and interdisciplinary debate on “-isation” processes. This includes processes of economisation (Çalışkan & Callon, 2009, 2010), financialisation (van der Zwan, 2014), or assetisation (Birch & Muniesa, 2020), insofar as this process applies to nature, environmental problems, or environmental politics (Bracking, 2020; Castree, 2003; Chiapello, 2020; Levidow, 2020); and, in reverse, the less explored processes of climatisation (Aykut & Maertens, 2021), or environmentalisation (Ledgerwood & Broadhurst, 2000) of economics, finance, macroeconomic statistics, and, with regard to this thesis, accounting. We shall see that the two abovementioned processes are often taking place together, namely an environmentalisation of accounting with ecological concepts brought into accounting, and an economisation or financialisation of nature, or, more specifically, of environmental politics.

This point is related to the third contribution of the thesis on the limits of the economic valuation of nature and its promised commodification as an environmental conservation strategy. Drawing on literature that already made this point (Boisvert, 2016; Dempsey, 2016; Fletcher,

2023; Robertson, 2006), I explain how this solution to environmental conservation can remain so prominent in environmental conservation debates, despite its limited outcomes. I show that through symbolic politics, natural capital accounting and the economic valuation of nature are being spectacularised, staged, and performed (Maechler & Boisvert, Forthcoming), to the point that the reality of natural capital accounting, its anchoring in the practice of the actors, is relegated to the second level. I thus show how valuation-centred narratives have become obligatory passage points in conservation discourse and debates.

Fourthly, this thesis contributes to the IPE literature on standards and standardisation, and to the way they epitomise conflicting forms of authority in global governance (Graz, 2019; Green, 2014). Such competition between standards and forms of authority is valid within each accounting world, and primarily between the last two of them. In the second accounting world, standards for natural capital accounting entail competition between different forms of private authority, primarily between the Natural Capital Coalition and the International Organization for Standardization (ISO). The last accounting world, that of accounting for nature-related risks, is the one in which the prospect of a “standard war” (Yates & Murphy, 2019, p. 243) between different forms of authority – public, transnational, and private – is the most prominent. This echoes the already documented competition between financial accounting standards and their takeover by a private organisation, the IFRS Foundation, in the early 2000s (Leblond, 2011; Mügge & Stellinga, 2015; Perry & Nölke, 2006).

Finally, the thesis contributes to scholarship on risk and uncertainty in times of global ecological crisis. Theoretically, first, it is enacted into the first article of my thesis which proposes a new way of conceiving the limits under which uncertainty can be turned into risk, echoing a rich literature in IPE and cognate fields on this theme (Best, 2008; Dannreuther &

Kessler, 2017; Dannreuther & Lekhi, 2000). Empirically, I show the practical limits of accounting to deal with the often labelled “radical” or “deep” uncertainty of the ecological crisis (Chenet, Ryan-Collins, & van Lerven, 2021; N. Taylor, 2022). Then based on the empirical analysis of the three accounting worlds, and more particularly of the last one, I argue that the uncertainty involved in the global ecological crisis is potentially made manageable – converted into risk –, but only for the most powerful actors of the global political economy. Closely linked to this point, my thesis also indirectly contributes to an interdisciplinary and cross-thematic debate on the power relations hidden behind the supposed objectivity and neutrality of numbers as management tools (Beerli, 2017; Broome & Quirk, 2015; Desrosières, 2008a, 2008b; Mennicken & Espeland, 2019; Mennicken & Salais, 2022; Mügge & Linsi, 2020). While I do not focus specifically on numbers, I explore the different ways they are created, which knowledge is deemed relevant for them to be developed and used, how the standards on which they are based are set, how they should be used, and by whom.

After this introduction, the **second chapter** presents the literature closely related to my empirical object. In the first part, I begin by discussing accounting research, and more specifically critical accounting studies that propose to consider accounting not only as a technical object but also (and especially) as a political one. I then present accounting studies that have explored, but mostly theoretically proposed, accounting methodologies for nature. In the second part, I broaden the scope to discuss literature on the political economy of the ecological crisis, beginning with interdisciplinary studies on the economic valuation of nature, and the related, and debated, creation of markets out of these valuation techniques. I finally discuss how accounting for nature relates to broader debates on the (international) political economy of global environmental governance and its historical dynamics.

The **third chapter** is dedicated to the conceptual framework. I start by stressing that the main challenge in times of crisis revolves around the ability of international actors to decide and act in (or from) a state of uncertainty, and thus to turn the latter into risk. I then present the first article of my thesis, which argues that there are limits in the substitution of risk for uncertainty. Afterwards, I discuss the role of accounting standards in reducing uncertainty. In the second part of this chapter, I present Boltanski and Thévenot's concept of common worlds from which I coin the one of "accounting worlds". I finally discuss the concept of "capitalocentrism" coined by J.K. Gibson-Graham, from which I develop the one of "valuation-centrism" used to characterise the critical disjuncture between discourse and practice regarding accounting for nature, and more specifically regarding natural capital accounting and nature valuation.

The **fourth chapter** of my thesis is dedicated to the methodology, which follows a research strategy that was mainly inductive, qualitative, and interpretivist. My main case, accounting for nature, is here divided into three different sub-cases, developed inductively throughout the thesis through further empirical research and theoretical readings. The three sub-cases, which are embodied into three ways of accounting for nature, also echo the three abovementioned accounting worlds. Data were derived through participant and direct participant observations in fifty-three events, followed both online and in-person for four years, complemented with fourteen semi-structured interviews and the same number of ethnographic interviews, document analysis, and, to a lesser extent, social media analysis.

The **fifth chapter** of the thesis is dedicated to the analysis and presents in chronological order the three accounting worlds for nature, each of them composing a sub-chapter. Each sub-chapter is organised in the same way. I start with the theoretical underpinnings of the accounting world. Then, I explain how such theoretical underpinnings have been internationally institutionalised.

Finally, I mobilise my observations to analyse the contemporary embodiments of the accounting world in question. I conclude this chapter by discussing the commonalities and differences between those three accounting worlds, coming back to Boltanski and Thévenot's concept of "common worlds".

In the **conclusion**, I first discuss three limits of the thesis: 1) Its Eurocentric character; 2) The lack of balance between the different accounting worlds, and thus between the different parts of the analysis; 3) A limited analysis of the circulation of actors and organisations between, and within accounting worlds. I finally discuss the abovementioned contributions of the thesis as they were presented above and come back to my three research questions.

2. Accounting and the global political economy of the ecological crisis

This chapter examines the existing literature closely related to accounting for nature and the historical, economic, and political context in which it is embedded. In the first part, I start by discussing accounting research, and more specifically critical accounting studies that propose to consider accounting as a political object with the power to shape not only the economy, but society as a whole. I then present studies that have explored, but most often proposed, accounting methodologies for nature. In the second part, I broaden the scope to discuss literature on the political economy of the ecological crisis, beginning with interdisciplinary studies on a phenomenon that is closely related to accounting for nature, namely the economic valuation of nature, and the related, and debated, creation of markets from these valuation techniques, eventually leading to the economisation, commodification, or financialisation of nature. I then discuss how accounting for nature relates to debates on the (international) political economy of global environmental governance and its historical dynamics, with a particular attention on scholarship that explored the strategies of economic actors to ensure the fungibility of environmental concerns within capitalism.

2.1 Positioning the thesis in research in and on accounting

Accounting for nature has been studied since the 1990s by accounting scholars themselves. Part of this literature is very insightful to understand the critical importance of accounting in shaping contemporary capitalist dynamics. But the stream that focuses specifically on nature has pursued a different, mainly policy-oriented, research agenda. Though other social science disciplines, including IPE, have addressed both traditional accounting and accounting for nature, most of the literature in this field has been published by accounting scholars.

This sub-chapter is organised as follows. I first discuss, based on critical accounting studies and a few IPE scholars, why and how accounting should be viewed as political, rather than only technical. I then explain how my thesis relates to – but primarily departs from – existing research on accounting for nature. Ultimately, I conclude that the current research on accounting for nature would benefit significantly from a much broader engagement with global political economy analyses, particularly here global political economy analyses of environmental governance, which help understand how it is developed, rather than how it can hypothetically be developed. I thus suggest that current studies fail to consider and thus explain the wider context in which accounting for nature has evolved over the last three decades and the reasons and processes by which it has failed to deliver its promises.

2.1.1 Accounting as political

Critical accounting research is an interdisciplinary, although strongly informed by sociology, sub-field of “mainstream” – or, as Roslender (2017) puts it, “technical” – accounting research institutionalised in the early 1990s. While mainstream “accounting (research) seeks to facilitate better accounting (practice) [...] [c]ritical accounting has as its objective the creation of a better society” (Roslender, 2017, p. 4; see also: Cooper & Hopper, 1990). The creation of a better society through accounting practices entails two research objectives. Firstly, deconstructing the dominant categories, principles, and concepts of accounting. Secondly, proposing new accounting practices out of this deconstruction. Indeed, Laughlin defines critical accounting studies as followed:

“A critical understanding of the role of accounting processes and practices and the accounting profession in the functioning of society and organisations with an intention to use that understanding to engage (where appropriate) in changing these processes, practices and the profession.” (Laughlin, 1999, p. 73)

I focus here mainly on the first objective pursued by critical accounting scholars, before turning to the second research objective that has led accounting scholars interested in environmental issues to propose new accounting systems and methods.

Critical accounting scholarship highlights the power relations involved in the production and dissemination of accounting numbers, from the negotiations that precede and surround the development of accounting standards to their application by accountants, their auditing by certified specialists, to their mobilisation by their users (Capron, 2005; Clark, 2019; Ramirez, 2013; J. J. Young, 2006). They regularly draw on sociological approaches to the study of quantification, which put forward the critical role of calculation and quantification in modern societies (Espeland & Stevens, 1998). This includes accounting, which they apprehend as “the cognitive infrastructure of capitalism, including how standardized methods for valuing and pricing are created” (Mennicken & Espeland, 2019, p. 227). As explained by Power, such cognitive infrastructure entails “a form of knowledge, grounded in statistical thinking, and conducted as punctuated episodes of calculation” (Power, 2016, p. 11), with the ultimate objective of “managing everything” (Power, 2004). Accounting is thus frequently described and analysed as an attempt to deal with the uncertainty of the future through standardised measures, a process that entails the substitution of risk for uncertainty (Maechler & Graz, 2022). I will elaborate on this point in the next chapter specifically devoted to the conceptual framework, in which I will relate the attempts to substitute risk for uncertainty to the development of accounting standards.

Critical accounting studies are not only interested in the creation of accounting numbers but also in their broader societal implications. Accounting would carry a “hidden power”, such as that of producing neoliberal subjectivities and thus governing individuals and social relations

(Boholm & Corvellec, 2016; Hummel & Hörisch, 2019; Power, 2022). A number of authors thus see accounting as representing veritable instruments of biopolitics in the Foucauldian sense: it enables actors and institutions not only to count but also and most importantly to monitor and govern society (Mennicken & Miller, 2012; Miller & O’Leary, 1987; Power, 1997). Although I am not building on such a Foucauldian framework, we shall see throughout the thesis that even though accounting for nature has never really been applied in the intended form or scale, it has, however, allowed some actors to govern the global politics of the ecological crisis by ensuring that debates focus on technical points related to, for example, measurement issues, thereby silencing proposals for more structural transformations to face the ecological crisis. I will again elaborate on this point in the next chapter devoted to the conceptual framework, notably by developing a framework inspired by Gibson-Graham’s concept of capitalocentrism (2006).

Those scholars have also shown that accounting – both as a discourse and a technical practice – is closely linked to the historical evolutions of capitalism (Bryer, 2000a, 2000b; Richard, 2015). Accounting can be considered as both the receptacle and vehicle of an ideology, driving for instance, in the most recent years, processes of managerialism, globalisation, neoliberalism, or financialisation (Carruthers & Espeland, 1991; Chiapello, 2007, 2015; Georgiou & Jack, 2011, 2011; Haslam, Tsitsianis, & Katechos, 2018; Murray, 1990; Power, 2009; Richard, 2015, 2017; Roslender & Graham, 2018). We will see that some of these processes apply in different ways to nature and the politics of the ecological crisis through accounting for nature, as will be discussed in particular in the third article of the thesis (Maechler 2022).

For critical accounting scholars, accounting is thus evidently not only technical, but also political, and has the power to shape not only markets but society as a whole – a perspective

that I fully share in this thesis. From this view, accounting cannot be understood as the neutral expression of an objective economic reality. Accounting must be seen as the result of social choices with the power to shape *how* and *for whom* reality is represented (Chiapello, 2008; Puroila & Mäkelä, 2019; Revellino & Mouritsen, 2015; J. J. Young, 2006). While this literature is very useful in capturing the political dimensions of accounting, it sometimes lacks an understanding of the international and/or transnational dimensions of accounting.

While IPE research has also extensively explored the historical roots and implications of similar processes of neoliberalisation, globalisation or financialisation (Best, 2005; Fawcett, Flinders, Hay, & Wood, 2017; Gill, 1995; Helleiner, 1996), it has rarely identified accounting as part of these processes. Moreover, IPE scholars who have looked at accounting have instead linked it to another process, namely the privatisation of global governance. A number of IPE scholars have indeed analysed both the competition and cooperation between public, private, and hybrid forms of authority in the setting of accounting standards, responding to broader debates in this field (Graz, 2006)⁶. They have described and analysed the transformations of accounting governance starting in the early 2000s, when most countries – the US excluded – delegated their authority and sovereignty over financial accounting standards to a private organisation, namely the IFRS Foundation (Leblond, 2011; Mügge & Stellinga, 2015; Nölke, 2005; Perry & Nölke, 2006; T. Porter, 2005). This literature is very insightful for understanding the international and political dimensions of accounting, and the third paper in the thesis (Maechler, 2022) not only takes inspiration from this literature but also draws some parallels with it. Indeed, the EU is now competing with the IFRS Foundation in setting accounting standards for

⁶ More generally, the 2000s was a period in which many IPE scholars sought to conceptualise and qualify the different forms of authority in global governance (Cutler, Haufler, & Porter, 1999; Graz & Nölke, 2011; Green, 2014; T. Porter, 2008). Financial accounting standards thus offered one, among others, illustrative case study of such tension between these two (or sometimes more) forms of authority.

nature, trying to regain sovereignty that it (i.e., the EU) has largely lost in the early 2000s when it comes to traditional financial accounting standards.

I have shown here that accounting – its developments and effects – has political and international dimensions, although the latter has been less studied. However, a major difference between traditional (financial) accounting and accounting for nature is that the former is most of the time applied close to the form and scale for which it is intended. So far, this is rarely the case when it comes to accounting for nature.

2.1.2 Accounting for nature: For a comprehensive political economy analysis

Now that we have seen how critical accounting studies provide an understanding of the political dimensions of accounting, we can turn to studies that have specifically examined how accounting was – or could be – applied to nature. Critical accounting scholars were interested early on in how accounting was not only invisibilising nature, but also at the root of its degradation (R. Gray, Owen, & Maunders, 1987; Maunders & Burritt, 1991). However, socio-environmental accounting, or sustainability accounting research – the label is still contested (Bebbington et al., 2021; Villiers & Maroun, 2018) – then focused almost exclusively on the second objective of the critical accounting studies, i.e., changing accounting “processes, practices and the profession” (Laughlin, 1999, p. 73). Starting from the assumption that “financial information does not sufficiently discharge organizational accountability to members of society who are demanding an account of the social and environmental impacts of companies’ and other organizations’ activities” (Villiers & Maroun, 2018, p. iii), socio-environmental accounting scholars (I will stick to this label) have early on advocated for the transformation of accounting in light of the ecological crisis, convinced that “accounting and

the accounting profession may set about contributing to the urgent process of environmental protection” (R. Gray, 1990, p. 19).

Since then, most socio-environmental accounting studies have been about designing new accounting frameworks that include nature in the calculus of economic progress. For instance, they have proposed many methods to account for specific dimensions of nature, such as “an accounting approach for the management of ecosystems” (Feger et al., 2019, p. 974), a “normative model for accounting for soil health inspired by earlier work on biodiversity reporting, ecological accounting and extinction accounting” (Maroun & Atkins, 2020, p. 41), or a system of accounting for “non-human animals” (Vinnari & Vinnari, 2021, p. 1). Another strand of socio-environmental accounting research has measured the effectiveness of accounting for nature, its different standards, methodologies, frameworks and initiatives. They have looked at how many companies are using the standards, whether they are using them in the right way, whether this information is being mobilised by the intended users, and whether it is achieving its intended purpose of addressing the ecological crisis. In other words, they have examined the conditions of success of accounting for nature and proposed different solutions to fill its identified weaknesses (Balluchi, Lazzini, & Torelli, 2021; Brooks & Oikonomou, 2018; Demaria & Rigot, 2021; Jeriji & Louhichi, 2021; Nor, Bahari, Adnan, Kamal, & Ali, 2016; Senn & Giordano-Spring, 2020). Although some scholars of socio-environmental accounting may be critical of current accounting methods for nature (Adams, 2020; R. Gray, 2006), they generally consider that, if applied correctly, it is a promising solution to the ecological crisis, allowing environmental issues to be integrated into decision-making processes.

Socio-environmental accounting scholars explicitly consider doing “critical accounting research that matters” (J. Brown & Dillard, 2018, p. 443), which means that would be doing both critical *and* policy-oriented research. In my view, however, socio-environmental accounting is primarily a policy-oriented field of research. If they regularly complain about developments in accounting for nature that do not go in the directions they propose (Abela, 2022; Adams & Mueller, 2022; R. Gray, 2006), they rarely raise the political economy dimensions of this lack of change, in stark contrast to the critical accounting research discussed above, which engages more forcefully with the political dimensions at play in accounting standards, calculations and practices. Socio-environmental accounting scholarship needs to be far more recognisant of the deeper international political economies that enable and resist the changes they propose. In order to do this, I believe it is necessary to situate accounting for nature within broader debates on the political economy of global environmental governance.

IPE scholarship has mainly considered accounting for nature as a manifestation of the authority of private actors in global environmental and/or financial governance. Literature revolves almost entirely around one researcher, Thistlethwaite, and his PhD thesis on this topic at the University of Waterloo (Thistlethwaite, 2011b). He then published on the competition between accounting standards for nature and the authority involved in their setting (Thistlethwaite, 2014), the role of private experts and political entrepreneurs and the networks they constitute (Thistlethwaite, 2017; Thistlethwaite & Paterson, 2016), or the reason why traditional financial accounting standards disregarded environmental degradations (Thistlethwaite, 2011a). He focused on a particular type of accounting standard, namely reporting standards. Closely linked to financial accounting and the third accounting world, such reporting standards do not intend to transform (financial) accounting, but only to provide new information on the sustainability dimensions of firms, which is not exactly what accounting for nature is about. While accounting

for nature ended up being at best a new piece of information alongside traditional accounting statements – as will be developed in the last part of Chapter 5 –, it still has the ambition to compete with and be integrated into traditional accounting. I, therefore, present a different story from Thistlethwaite’s one, in which accounting for nature has much more ambition, or promises to offer.

Although we are not dealing with exactly the same subject matter, I still have an important point of disagreement with Thistlethwaite, who paradoxically follows the socio-environmental accounting literature and its general optimism about the ability of the information provided by these new accounting or reporting frameworks to make global markets “greener”. Such optimistic vision is well reflected in the following:

“Sustainability accounting initiative has nevertheless the potential to increase the materiality of these risks for investors by transforming their understanding of the links between their practices and outcomes for sustainability. *Transparency* through improvements in accounting practices could therefore lead to a transformation of capitalism, as capital is reallocated toward more sustainable and low-carbon economic activity.” (Thistlethwaite & Paterson, 2016, p. 1198, my emphasis)

I will come back to the technical concepts of materiality and transparency in more detail in the last part of Chapter 5, dedicated to the third accounting world, that of accounting for nature-related risks. It should however be noted here that it is precisely the type of institutional discourse that I try to deconstruct in this thesis. Indeed, transparency and measurement – as neoliberal forms of governance (Best, 2005) – will do little to address the challenges of the global ecological crisis on their own, as it is based on the (empirically falsified) assumption that with the right information (or “price signal”), markets will allocate capital in an ecologically optimal way (Christophers, 2017).

Beyond IPE, scholars in political ecology or STS explored accounting for nature through the second accounting world – natural capital accounting and nature valuation. Yet, they primarily focused on what accounting for nature could achieve if it was effectively realised and widely implemented – if nature was actually commodified, capitalised, or financialised on a global scale (Dehm, 2023; Levidow, 2020; Sullivan, 2014; Sullivan & Hannis, 2017). Commodifying nature is indeed the proposition underpinning natural capital accounting. Yet, they miss the point that natural capital accounting has never been realised in practice, although, as will be shown, it has become a totalising discourse in nature conservation circles. I will discuss this point in more detail in the next section, specifically devoted to nature valuation.

To come back to socio-environmental scholarship, while we share an important interest in the relationship between ecological sustainability and accounting, our initial research objective is different. Mine is to better understand the growing importance of accounting discourse, thoughts, and practices applied to nature over the last decades, initially indistinctively of specific accounting projects. In contrast, socio-environmental accounting scholars are primarily interested in how specific accounting systems and practices could be improved. Moreover, we also start from a different interpretation of what “accounting for nature” is or not. For me, accounting for nature exists as long as actors refer to accounting and its transformation as a response to the ecological crisis – including as a discourse only. For socio-environmental scholars, in contrast, accounting for nature only exists if already existing accounting concepts, categories, and principles are concretely applied to environmental problems, which sometimes excludes, as we shall see, natural capital accounting – the second accounting world –, for which accounting is often mobilised by the actors as an argument of the authority of their respective undertakings, rather than as a concrete set of tools, techniques, and instruments (Maechler & Boisvert, Forthcoming).

It should also be noted that socio-environmental accounting scholars, just as critical accounting ones, have not studied a particular type of accounting system, namely public accounting embodied in its hegemonic version under GDP, and here represented by the first accounting world. In general, public environmental accounting has received very little attention, with the exception of Bérard (2019) and Vanoli (2013), who provide landmark analyses of the internal controversies that underpinned the development of the UN System of Environmental Economic Accounting (SEEA). While IPE and cognate fields have explored how other issues are struggling to find their way into the macroeconomic accounting landscape, such as unpaid household (DeRock, 2019), and, more generally, the construction of GDP as a hegemonic macroeconomic indicator (Lepenies, 2016; Mügge, 2016; Schmelzer, 2015, 2016), as well as the political underpinnings of the “beyond GDP” agenda (Hayden, Gaudet, & Wilson, 2022; Yarrow, 2018, 2022), they have not given attention to the specific relationship between GDP and the environment. This gap in research on public environmental accounting is not entirely filled in this thesis. I indeed have much more to say on the two other accounting worlds. This limit, to which I will come back in the conclusion, is partly linked to the way I have entered my object, i.e., through events. Indeed, since public environmental accounting is the least dynamic of the three accounting worlds, it is also the one where there are the fewest organised events. However, I still provide a new, innovative understanding of public environmental accounting by analysing it in relation to two other ways of accounting for nature, while highlighting some of the current controversies within this accounting world primarily related to the issue of monetary valuation.

Ultimately, this thesis is the first to provide a comprehensive analysis of accounting for nature – as the literature, including in accounting research, has always focused on specific accounting

practices or initiatives, or, in other words, on one accounting world. In the remainder of this literature review, we will move away from accounting for nature as such, to discuss the broader economic, political, and historical context in which it is embedded, namely the global political economy of the ecological crisis.

[2.2 The global political economy of the ecological crisis](#)

I now move away from accounting per se to discuss some objects, phenomena, or dynamics closely linked to accounting for nature and the context in which it is embedded. I first discuss an interdisciplinary literature on the economic valuation of nature. A strand of it has shown that nature valuation has more often than not failed to deliver on its promises, yet without really explaining how, despite this failure, the promises underpinning these valuations schemes continue to be maintained. I then discuss research that has examined global environmental governance from a (global or international) political economy perspective since the 1990s, and the strategies deployed by economic actors in this context to ensure the fungibility of environmental concerns within capitalism.

2.2.1 Nature valuation: Commodification and its limits

The story of accounting for nature is consistent with a long-standing proposal in nature conservation circles to protect nature by integrating it into markets or, in other words, by turning it into a commodity. Such an outcome requires prior valuation of nature, usually in economic, i.e., monetary terms. This section discusses an interdisciplinary body of scholarship ranging from political science, economic geography, ecological economics, STS, socioeconomics, political ecology, anthropology, and philosophy, that critically engages with the issue, techniques, practices, or discourse of nature valuation, and the possible creation of markets out of such valuation schemes. I start by explaining how nature can be valued based on existing

academic analyses, and then move to the critics of the commodification of nature out of such valuation schemes.

Well-established studies in socioeconomics and the history of economic thought have examined valuation exercises taking place in the context of oil spill litigations – where valuation is used after damages to nature, and not to commodify it. Analysing the Exxon Valdez oil spill on March 24, 1989, Maas and Svorenčík (2017), but above all Fourcade (2011, p. 1734), accurately described how “[e]xperts in statistics, economics, and accounting thus enter the legal realm as providers of quantifiable standards of decision-making, supplying [...] the legal system with sophisticated technologies for establishing value where value is hard to identify or calculate”. In her article comparing oil spill litigations in France and the United States, Fourcade reports the technical, moral, or even cultural differences between those two cases when it comes to attributing a “monetary value to intangible things like nature” (Fourcade, 2011, p. 1735). What needs to be kept from this example is that controversies were very high, including in relation to which valuation technique to use (Maas & Svorenčík, 2017). The same is true for monetary valuation of nature techniques used in environmental impact assessments and cost-benefit analyses to account for the effects of development projects on specific ecosystems. Again, scholars underline the controversies related to such valuation exercises aiming at estimating and eventually compensating for future damages to the environment (Jacobs, 1997; Knetsch, 2005; Pascual et al., 2012). However, those cases can clearly be considered “easy ones” when it comes to attributing a monetary value to nature. The nature to be valued can be identified without too much approximation. It concerns specific ecosystems, which are located in the territory of one state only. The promises embodied in accounting for nature, and other projects of nature valuation, are about the whole of nature.

Valuation (and further commodification) of nature requires prior commensurability between the diversity of nature. Greenhouse gases, which are a very specific kind of nature, or, more precisely, a specific set of chemical compounds, have received much attention in the context of climate change mitigation. The construction of one of these chemical components, Carbon, as the global gas, or the global equivalent, has been explored by STS scholars in particular, explaining that the commensurability of carbon is not only a scientific but also a political matter⁷. A landmark article by Mackenzie examined how some accountants have defined legally and technically the commensurability of greenhouse gases globally, so that “the destruction of one gas in one place is made commensurate with emissions of a different gas in a different place” (MacKenzie, 2009, p. 441). Such global commensurability of carbon in different places but also at different times (Ehrenstein & Muniesa, 2013; Green, 2018) is considered to be required to create a global carbon market. Mackenzie, however, stressed the limited success of carbon markets to achieve their goals, also considered by Callon (2009) in the same special issue of the journal *Accounting, Organizations and Society*, as an on-going and controversial experiment. Accounting for nature, and more particularly natural capital accounting, bears the promise of reproducing such global commensurability not with carbon only, but with the whole of nature and the diversity of biodiversity and ecosystems, to eventually, at the very end, turning nature into a commodity that can be exchanged on a marketplace. We shall see, however, that no physical metric or “equivalence convention” (Desrosières, 2008a, 2008b), such as carbon, has been established for biodiversity and ecosystems, even though money or “monetary equivalents” are supposed to fulfil this function.

⁷ Chemical components contributing to climate change indeed do not all have the same global warming potential (GWP), which is measured over a 100-year period. If Carbon (CO₂) has a value of 1, Methane (CH₄) is estimated to have a GWP of 27-30 over 100 years, while Nitrous Oxide (N₂O) has a GWP of 273. See: United States Environmental Protection Agency. “Understanding Global Warming Potentials”. (2022). <https://www.epa.gov/ghgemissions/understanding-global-warming-potentials> (accessed April 10, 2023).

For biodiversity and ecosystems, in addition to the frequently noted difficulty of choosing the metric (Ruhl & Salzman, 2000), the delineation of commensurable entities, units and equivalence classes has been shown to be challenging. Therefore, while commensurability between greenhouse gas diversity is achieved prior to monetary valuation through CO₂ equivalences, for biodiversity and ecosystems, commensurability is usually achieved directly by monetary valuation (Gadrey & Lalucq, 2015). While the monetary value of CO₂ equivalents is established by the number of carbon permits issued by the regulatory authority on the one hand, and then by the “law” of supply and demand for these permits (Green, 2021), the value of biodiversity and ecosystem is rarely directly derived from the market, but by using various economic techniques (Gadrey & Lalucq, 2015; Maes et al., 2018). As shown by the literature, particularly in ecological economics, this obviously raises fundamental theoretical, methodological, and ontological challenges (Bartkowski, Lienhoop, & Hansjürgens, 2015; Farnsworth, Adenuga, & de Groot, 2015).

We will see in the analysis that these challenges have not prevented many monetary valuation exercises to be conducted, the most emblematic being the 1997 study of Costanza and his colleagues estimating the global monetary value of nature (Costanza et al., 1997). Yet, this does not mean that whole of nature is being commodified. Marxist-inspired analyses, in particular, have explained how profits from nature are extracted through the ownership and control of natural assets (D. Harvey, 2003; Moore, 2015) – a process recently embodied under the label of “rentier capitalism” (Christophers, 2022). Those scholars argue that the commodification of nature involves a process of “enclosure”, in which previously uncommodified resources are brought into the market and subjected to the logic of capital accumulation (Huber, 2022; Omeje, 2021). In this case, nature – or, more precisely, land and natural resources – is indeed

commodified, as it appeals to specific kinds of natures that can be clearly privatised and individualised, and whose value can be established in a marketplace. But nature cannot always, indefinitely and indistinctively, be commodified, as is yet often implied by Marxist-inspired scholars (Dehm, 2023, p. 255; see also: Levidow, 2020; Sullivan, 2013). As well explained by Castree (2003, p. 273), “Marxian criticisms of nature’s commodification are rarely explicit and often assumed to be self-evident”.

Castree indeed distinguishes “real commodification” from “incomplete commodification”, i.e., “those cases where nature puts barriers in the way of complete commodification” (Castree, 2003, p. 288). For this, he identifies different criteria that are involved in the making of a “real commodity”: privatisation, alienability, individuation, abstraction, valuation – meaning “how things take on specific forms of value” (Castree, 2003, p. 288) –, and displacement. He explains that valuation is not enough to make the whole of nature a commodity, let alone a global commodity. As he points out by taking the example of the above-mentioned study of Costanza and colleagues (1997), “putting a monetary value on the world’s biodiversity [which...] obviously does not imply that this biodiversity is alienable en masse or that it can literally be individuated” (p. 285). To sum up, he considers that “some natures ‘resist’ complete commodification (physically and morally), while others are more readily subsumed” (2003, p. 289).

Castree’s essentially theoretical argument has been supplemented by numerous empirical studies. Robertson in particular has explained at length how nature, valued and turned into natural capital or ecosystem services, resists its commodification and capitalisation (Dempsey & Robertson, 2012; Robertson, 2006, 2012). Yet, it is true that markets for nature do exist on paper, giving rise, as I will also show in the analysis, to institutions that promote them, and to

dedicated communities of professionals and experts. Yet, many scholars have stressed that environmental markets had nothing like “real” markets. According to Felli (2014), they are institutional responses to the threat of accumulation posed by environmental regulations, while for others they are not only responses to regulations but forms of regulations. As stressed by Dempsey and Suarez, nature-based markets, as they are frequently called, “require substantial public funding, command-and-control legislation, and other elements seemingly anathema to ‘truly’ market-oriented approaches” (Dempsey & Suarez, 2016, p. 655). The own name of such an instrument – “market-based” instruments or “nature-based” markets – reveals that it draws on the idea of the market, on the language of the market, but its implementation and functioning are a far cry from real markets (Boisvert, 2016; Neyland, Ehrenstein, & Milyaeva, 2019).

Scholarship in political ecology, ecological economics, and geography has shown that markets for nature have been limited to specific projects such as payment for ecosystem services (PES), which theoretically involves a transaction between two parties – a service user and a service provider (Börner et al., 2017). Costa Rica is often taken as *the* success story for demonstrating the feasibility of PES and consequently that nature-based markets can actually work as a solution to environmental problems. However, many studies have shown that this success again depends largely on the proactive action of public authorities – which are actually the money provider (Engel, Pagiola, & Wunder, 2008; Etrillard, 2016). According to Fletcher and Breitling (2012), PES in Costa Rica are closer to “disguised subsidies” than “market mechanisms”. They are also often attached to global development programs (Karsenty, Sembres, & Randrianarison, 2010; Shapiro-Garza, McElwee, Van Hecken, & Corbera, 2020).

This tendency to (re)frame environmental public policies in the language of the market is evident since the early 2000s. The economic metaphors, or concepts, of natural capital,

ecosystem services, or natural assets, are clear embodiments of this (Åkerman, 2003; Coffey, 2016; Nadal, 2016; Spash, 2009). Another good case in point is reflected in wetland compensation policies. The latter were already implemented in the United States in the 1980s but then renamed as “conservation banks”, or “species conservation banking” in the hope of “receiving financial gains for habitat” (Boisvert, 2015; Fox & Nino-Murcia, 2005, p. 996). The main justification for this reformulation is that it will attract private funding for nature conservation projects (Foyer, Viard-Crétat, & Boisvert, 2017; Tordjman & Boisvert, 2012). A return on investment is indeed promised as money is invested in “natural capital” or “conservation banks”. But such schemes rarely work as planned (Fletcher, 2023), as has been detailed by Dempsey and Suarez in a landmark analysis of “for-profit biodiversity conservation schemes”.

“Even where initiatives labeled as ‘marketbased conservation’ are functioning, they are often not quite performing as advertised (or perhaps feared) [...] Highly financialized and liquid markets in conservation, although perhaps desired by proponents of market based and profit-driven approaches, are by no means an established reality, and despite the rhetoric, remain, as ever, just around the corner [...] capital is not flowing because conservation is not a good investment”. (Dempsey & Suarez, 2016, pp. 654, 664, 667)

The commodification or marketisation of nature, sometimes anticipatively feared by part of a Marxist-inspired literature (Dehm, 2023; Levidow, 2020; Sullivan, 2013), is not thus really happening given the “costly exercise required to render current niche and idiosyncratic nature markets conventionally ‘investible’” (Kedward, zu Ermgassen, Ryan-Collins, & Wunder, 2022, p. 1). This does not mean that valuing nature in economic terms is not problematic. As I will detail in the analysis, the argument that conservation projects will become attractive to private funding thanks to the language of the market is often used as a diversionary tactic in the face of the threats of the ecological crisis and the urgent need for more structural responses to it. By

subverting all exit strategies from the ecological crisis into fictional valuation practices, the “status quo”, or “business as usual”, is maintained.

More recently, scholars of international relations and global environmental governance have even shown that the language of the market is not even used by those who are supposed to appropriate it, namely international conservation professionals. The concept of ecosystem services, for instance, has failed to become embedded in international conservation practices (Allan, Auld, Cadman, & Stevenson, 2022; Craig, Stevenson, & Meadowcroft, 2019; Stevenson, Auld, Allan, Elliott, & Meadowcroft, 2021; Stevenson et al., 2021). Practical conservation decisions rely only marginally on economic valuations of nature. Just as for accounting for nature, there is an enduring disjuncture between discourse and practice in the economic valuation of nature.

To sum up, the literature has shown that nature resists commodification (Castree, 2003; Robertson, 2006), that it is “an unfulfilled promise to date” (Allan et al., 2022, p. 1), that it “failed to become embedded in international conservation practices” (Stevenson et al., 2021, p. 4), or, as stressed by Dempsey (2016, p. 233), that it is “at once a totalizing mainstream discourse, and one that exists on the margins of political economic life, on the outside of many flows of goods, commodities, and state policies”. In this thesis, I see the repeated failures of accounting for nature as part of such a broader pattern of unfulfilled – yet still powerful – promises. Indeed, the hegemony of this framing, with its effects of selection and amplification of certain variables, knowledge, and dynamics, and the correlative eviction of others, is not questioned at all. It obscures and silences other solutions to the ecological crisis involving “other natures” than the one that can be (economically) valued and measured accordingly.

This point has been, yet in a very different way, addressed by some philosophers and anthropologists. The former explain that nature indeed not only has an economic, but also intrinsic value: a value in and of itself, independent of human interests or desires (Hailwood, 2000; Maris, 2015; P. W. Taylor, 1986). Anthropologists, this time empirically, have shown how different relationships with natural values than economic ones are developed. Cultural anthropologist Descola (2015), in particular, has explored the ways in which different cultures conceptualise, value, see, and experiment nature. He argues that while Western cultures tend to view nature as separate from humans and as an economic resource to be exploited, other cultures view nature as connected to humans. Escobar (2008, 2018) has also shown how the dominant Western view of nature as a commodity is a cultural construction, and that other cultures have fundamentally different ways of valuing and relating to the natural world. Anthropologists thus underline the interdependence of humans and non-humans and the importance of diverse ways of knowing and valuing nature (Hastrup, 2015). My analysis does not show how nature as a sole source of economic value is *culturally*, but rather *politically* and *socially* constructed. Moreover, I only focus on the hegemonic economic discourse on nature. While I discuss the way in which such discursive hegemony obscures “other natures”, I do not make these “other natures” visible, all the more because of the very Eurocentric character of this thesis⁸.

It is interesting to note here that such an approach to nature valuation, namely the consideration of its intrinsic and cultural values, is institutionally on the rise in international scientific arenas. Anthropologists and philosophers of nature are indeed increasingly integrated into the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) which provide global assessments of biodiversity notably based on valuation techniques.

⁸ This issue will be discussed in the conclusion, in relation to the limits of the thesis.

However, as we shall see in detail in the analysis, it is hard for their messages to be diffused and communicated beyond the scientific report. In other words, I will suggest that is not enough to participate in the production of knowledge for that knowledge, in the way it is then communicated, to overturn a long-standing discursive hegemony related to the *economic* valuation of nature.

As we will see below, this hegemony can be linked to different strategies mobilised by international actors since the inception of global environmental governance to ensure the fungibility of environmental concerns within (global) capitalism. The scholarship discussed below is complementing the critical research on nature valuation, most particularly to help understand the interactions between international political and economic forces in shaping the global environmental agenda.

2.2.2 The political economy of global environmental governance

In the same year as the first-ever international conference on the environment, the United Nations Conference on the Human Environment was held in Stockholm in 1972, one of the most important, if not the most important, journal in the field of international relations, *International Organization*, published a special issue on the subject. Authors of the special issue considered “this challenge to be critical to the future survival and shape of the international system” (Kay & Skolnikoff, 1972, p. v), in particular regarding the two core domains upon which the field of IPE was just emerging: finance (Lee, 1972) and trade (d’Arge & Kneese, 1972). However, it was not until the early 2000s that environmental issues were addressed upfront by IPE scholars⁹. Despite this, environmental issues remain on the margins of IPE

⁹ Although, as noted by Clapp and Helleiner, Susan Strange “solicited a chapter by Dennis Pirages advocating an ‘ecological approach’ to the field in her 1984 edited volume identifying *Paths to international political economy*” (2012, p. 486-487, original emphasis).

research, as shown by the statistics presented in the recent special issue of the leading journal of the field, *Review of International Political Economy* (RIPE). Statistics from 2012 to 2020 show that the “climate, energy and environment” category has never been more than 10% of the total articles published yearly, with a notable total disappearance in 2016 and 2020 (Bair et al., 2023). The first topic published in RIPE is (by far) “finance and money”¹⁰. We shall see, however, that the IPE distinction between “finance” and “environment” is increasingly permeable, as an increasing number of financial actors – as my thesis also shows (Maechler, 2022) – are now including environmental issues within their mandate (Deyris, 2023; Quorning, 2023; N. Taylor, 2022). Although I also show that this is not an entirely new process, it is still leading to an increased interest in environmental issues among IPE scholars.

IPE – or GPE – of the environment is traditionally known for examining the intersection and interrelations between international political and economic forces in shaping the global environmental agenda (Clapp & Dauvergne, 2005; Clapp & Helleiner, 2012; Paterson & Newell, 2010). IPE studies have early on sought to understand how the global political economy, global capitalism, the market, liberal rules, values, and ideas, embodied by the influence of private economic actors, have shaped the pace and content of global environmental governance. According to Bernstein’s landmark analysis, the 1992 Rio Earth Summit and its treaties reflect such liberal norms and values – what he describes as “liberal environmentalism”, i.e., the practice of “linking the environment with other values, especially economic growth and liberal markets” (Bernstein, 2002, p. 1). According to him, this contrasts starkly with the origins of global environmental governance in the 1970s underpinned by the idea of “command-and-control” methods implemented by the State. Such environmental liberalism that legitimates

¹⁰ A category to which I hope this thesis also belongs, and more specifically the third article of my thesis (Maechler 2022), and, to a lesser extent, the first article precisely published in RIPE, but which I think will be considered in the environment category (Maechler & Graz, 2022).

growth in the context of environmental protection is framed as a “win-win” solution for states, markets, and nature, embodying the “new consensus on a liberal economic order” (Bernstein, 2002, p. 8; see also: Clapp & Dauvergne, 2005).

The literature has shown that liberal environmentalism, and, more generally, the possibility of reconciling ecological sustainability with economic growth has been pushed by different kinds of public and private “political entrepreneurs” (H. S. Brown, Jong, & Lessidrenska, 2009; Green, 2014; Moussu, 2017; Quorning, 2023), a concept that I also mobilise, distinguishing between “meaning” and “technical” entrepreneurs¹¹. The literature generally highlights the role of political entrepreneurs who are able to translate the complexity of the ecological crisis into meaningful messages that would compel economic actors to take environmental conservation into account in their decision-making processes, including the concepts, or metaphors, of natural capital and ecosystem services (Åkerman, 2003; Stevenson et al., 2021). The outcome observed and described is “the gradual realisation by various actors – governments, businesses, investors – that climate change is a systemic problem that will affect them in some way, and a threat that they must seek to turn into an opportunity” (N. Taylor, 2022, p. 4; see also: Paterson & Newell, 2010). To this end, these political entrepreneurs, including experts and sustainability professionals, mobilise “justifications for action [...] increasingly endogenous to the market” (Janković & Bowman, 2014, pp. 234–235). My thesis complements this research by showing how this market language is developed and maintained by political entrepreneurs, and how this language gradually evolved and eventually led financial accounting standard-setters – the IFRS Foundation in the first instance – to include environmental issues in their mandate.

¹¹ I will come back to this distinction in the conceptual framework.

From the beginning, IPE research has also focussed on how the “market vision” of nature conservation has been operationalised in ways to produce those supposedly “win-win situations” (Clapp & Dauvergne, 2005), which is notably embodied in private regimes, or private standardisation (Clapp, 2001). The International Organization for Standardization (ISO) and its ISO 14000 environmental management standard series is a good case in point, first published in 1992, just before the Rio Conference, by the British Standards Institution (BSI) – a historically leading national organisation of ISO (Yates & Murphy, 2009, 2019)¹². The ISO 14000 series has been formally included in the ISO architecture in 1996 and the standards have been widely diffused among business firms (Corbett & Kirsch, 2001). A number of IPE scholars have examined this standardisation process, epitomising the role of private actors in global environmental governance, or/and the privatisation of the latter (Clapp, 1998; D. L. Levy & Newell, 2005; Prakash & Potoski, 2006; Yates & Murphy, 2009, pp. 77–81). Some authors argue that ISO environmental management standards make business firms adopt environmental policies that go beyond legal requirements, which, according to them, could be more effective than public environmental governance, i.e., “command-and-control” (Prakash & Potoski, 2006)¹³.

Other scholars yet question the legitimacy and effectiveness of private environmental regimes (Bernstein & Cashore, 2007; Bled, 2009; Cashore, 2002; Orsini, 2010). Still today, “voluntary sustainability standards” in general embody a tensions between private and public authority (Graz, 2022; Ponte, 2019; Sun, 2022; van der Ven, 2019), and between different private

¹² BSI also recently developed standards for natural capital accounting in the hope that they will be taken up by the ISO standardisation process (BS 8632). See: BSI. “Natural Capital Accounting for Organizations. Specification”. (2021). <https://knowledge.bsigroup.com/products/natural-capital-accounting-for-organizations-specification/standard> (accessed April 17, 2023).

¹³ It is worth noting that a key difference between this IPE literature and the one on nature valuation described above is that the latter often take the “market-based approach” and the distinction between “public and control” as a word, meaning that they often do not clearly see the extent to which nature may, in fact, resist its commodification.

environmental regimes and standards, which some argue, increases the complexity of global environmental governance (Abbott, Green, & Keohane, 2016; Orsini, Morin, & Young, 2013). As discussed by Green (2010, 2014, chapter 5), the Greenhouse Gas Protocol first published in 2001 by WBCSD, WRI, and ISO is a good case in point regarding the competition between different private standards organisations.

Some similar processes can be observed and analysed not in-between accounting worlds, which remain relatively impermeable to the others, but within accounting worlds themselves. In the case of the second accounting world, that of natural capital accounting, we will see that one organisation, the Natural Capital Coalition, set up by WBCSD, has managed to capture most of the standardisation exercises, including in other standard-setting arenas such as ISO (Maechler & Boisvert, Forthcoming). When it comes to the third accounting world, that accounting of nature-related risks, we clearly assist, at the time of writing, to a competition between three entities: the U.S. SEC, the EU Commission, and the IFRS Foundation, each of them proposing their own set of standards and epitomising different forms of global authority (Maechler, 2022).

Often, standard-setter organisations are composed of a mix of both public and private actors, as in the case of the Natural Capital Coalition. Scholars of global environmental governance, and Andonova (2017), in particular, explored in detail the conditions of emergence and institutionalisation of such kinds of public-private arrangements. Again, she points out the key role of political “entrepreneurs to spearhead new institutional features” (Andonova, 2017, p. 35). As for private standards and their effectiveness, scholars have diverging views when it comes to the effects and desirability of such partnerships. For instance, Abbott (2012, p. 543) supports such sort of cooperation “in which international authorities engage directly with business firms, industry groups and other ‘targets’, influencing them to adopt more sustainable

behaviors [...] catalyzing, supporting and steering them as they seek to influence the ultimate targets of policy”. Others, in contrast, consider that public-private partnerships raise questions of legitimacy, effectiveness and accountability (Bäckstrand, 2006; Park & Kramarz, 2019). Gabor (2021) in particular argues that public-private partnerships are favouring private, financial interests, what she calls “the Wall Street consensus”. More generally, public-private partnerships, not only with regard to environmental policies but also in many other areas such as health, education or urban policies, have been criticised as being depoliticising forms of arrangement (Gideon & Unterhalter, 2017; Knutsson & Lindberg, 2020), giving the impression of a consensus for a yet deeply political, contested, problem, which does not (only) require new institutional designs (Louis & Maertens, 2021). As we shall see, this form of governance is deeply embedded in the way accounting for nature is organised, raising similar questions of legitimacy and depoliticisation.

Scholars of sociology and political ecology studying global environmental governance have explored the “staging” of consensus in more detail. Regularly building on ethnographic observations during environmental summits, they analysed them as theatrical enactments of global environmental politics and put emphasis on the performative power of symbols and narratives. Death, for instance, analysed the 2002 Johannesburg Summit (World Summit on Sustainable Development) and the 2009 Copenhagen Climate Change Conference (COP 15 of the UNFCCC) as two “moments of political theatre, performative enactments of legitimacy and authority, and sites for the communication of particular examples of responsible conduct” (Death, 2011, p. 1). In the same vein, Aykut and his colleagues (2021; 2022) examined the “performative” and “incantatory” dimensions of climate summits aiming at aligning actors’ expectations. Closer to me, scholars of political ecology have studied not multilateral summits as the above-mentioned authors but summits organised under the patronage of public-private

partnerships. Again, they put forward “the performativity of a conference site”: these moments are pivotal “in the merging of economic and ecological rationale” (Ken MacDonald & Corson, 2012, p. 163), leading “market-based environmental governance” or “neoliberal conservation” to become common-sense (Fletcher, 2014). The second article of my thesis, in particular, engages with this literature, to explain how the promise of natural capital accounting is maintained over the years notably by staging and performing nature as a capital, and how it reinforced valuation-centred narratives of nature (Maechler & Boisvert, Forthcoming). More generally, we shall see that the three accounting worlds described and analysed in this thesis have benefited greatly from the forums offered at major global environmental summits.

Accounting for nature is thus part of the different dynamics and processes of global environmental politics I have briefly described here. In this chapter, we have first seen that critical accounting studies have stressed the political dimensions of accounting, complemented by IPE studies on accounting that highlighted the international dimensions of it, mainly through the competition between public and private authorities in global governance. I then turned to the literature on socio-environmental accounting, which most often addressed the issue from a theoretical and policy-oriented perspective. In the second part, we have seen that a stream of nature valuation studies, on which I draw, has highlighted the limits of such instruments, not only to achieve their goals of a commodification of nature, but also to be used and deployed in practice. Finally, the literature on the political economy of the environment discussed the different strategies historically used by economic actors, notably by some political entrepreneurs, to promote the market as a solution to environmental problems. Some of the important concepts of this thesis have been touched upon in this chapter. The next chapter, specifically devoted to the conceptual framework, will elaborate on them.

3. Conceptual framework

This chapter presents the conceptual framework of this thesis¹⁴. It aims, firstly, at a higher theoretical and analytical level, to conceptualise, based on existing literature, an enduring challenge faced by international actors facing the global ecological crisis: deciding and acting in or from a state of uncertainty. I then present the first article of my thesis that identifies and conceptualises the limits in the substitution of risk for uncertainty. As we shall see, this theoretical article and its associated arguments about limits have some empirical value for this thesis. As I will show, accounting is indeed traditionally used in such context of uncertainty reduction when it comes to objectifying uncertain economic futures.

This latter point is made more explicit in the second part of this chapter, which engages more directly with the empirical object of the thesis. I provide the key analytical tools to address my research question with some concepts that have been specifically found through the process of data collection and analysis crossed with theoretical readings. Drawing on Boltanski and Thévenot's (1991) concept of "common worlds", I conceptualise the diversity of accounting for nature by distinguishing what I call three "accounting worlds for nature", or, simply, "accounting worlds". These three accounting worlds are also my three cases, thus developed and constructed through this process of going back and forth between the theoretical and the empirical. The distinction between the accounting worlds begun here will be continued in the next methodological chapter, in which I will present how the data was collected and interpreted

¹⁴ Some parts of this chapter are inspired by three articles currently under review or accepted with minor revisions. One of them is co-written with Jean-Christophe Graz and entitled *Facing uncertainty in times of crisis: A Knightian tale of three ways to claim knowledge about future states of the world*, and mobilised primarily in the first section of this chapter. The two others are co-written with Valérie Boisvert. One is entitled *Valuing Nature to Save it: The Centrality of Valuation in the New Spirit of Conservation*, and only mobilised in the last section of this chapter (in relation to J.K. Gibson-Graham). The last one is entitled *From biophysical calculations to financial risk assessment: Three worlds of nature accounting* (in French), and is used in relation to the "accounting worlds for nature". However, it should also be noted that this conceptual framework, especially as deeply reworked compared to those articles, aims at supporting and valorising the empirical findings of the thesis, notably in relation the three (other) articles formally included in the thesis.

in each of the three cases, and each of the three accounting worlds will be further analysed in the fifth chapter. At the very end of this chapter, I will discuss and present J.K. Gibson-Graham's concept of capitalocentrism from which I coin the one of "valuation-centrism" to assess the disjuncture between discourse and practice in the economic valuation of nature.

3.1 Facing uncertainty in the age of global ecological crisis

3.1.1 Crises as new stages of uncertainty

A large body of scholarship in IPE and cognate fields situated uncertainty as the main political driver and challenge of international crises. Crises confront actors with a threatening situation that requires decisions and actions under a high level of uncertainty (Hay, 1999; Koselleck & Richter, 2006). From the end of the 1990s onwards, crisis-thinking has been marked by an understanding of international relations viewed as more unstable than the Cold War and opening a "range of uncertainty and unpredictability about the present and foreseeable future" of hegemonic transitions (Arrighi & Silver, 2001, p. 258). The 2008 financial crisis further prompted scholars to look beyond strictly calculative rationalities supporting the knowledge deemed reliable for political decisions and actions facing the uncertainty of a crisis (Best, 2009; Kessler, 2009; Lockwood & Nelson, 2018; Nelson & Katzenstein, 2014). During a crisis, actors are indeed "unsure as to what their interests are, let alone how to realize them" (Blyth, 2002, p. 9).

For Nelson and Katzenstein (2014, p. 362) crises are uncertain times during which actors rely on social conventions or "shared templates and understandings" to make decisions. Studies have also shown that international actors face the uncertainty of a new crisis by relying on their own "pre-crisis repertoire" including their existing beliefs, worldviews, and experiences, to fit them into the new circumstances generated by the crisis (Carstensen, 2013; Golka & van der

Zwan, 2022). Drawing on the concept of “bricolage”, Carstensen (2013) explains that international actors, in his case financial ones, are projecting solutions to the crisis “from their own fiction”. This is reminiscent of the way in which environmental issues have been transformed by some political entrepreneurs into a meaningful economic language enabling international actors to make sense of the global ecological crisis. But such a “pre-crisis repertoire” may not be enough in times of global ecological crisis, which is – notably because of the far-off future at stake – marked more than other crises by an enduring, or so-called “deep” or “true” uncertainty (Bolton et al., 2020; Chenet et al., 2021). The complexity of processes related to climate change (Ehrenstein & Muniesa, 2013; Green, 2018), and even more so to biodiversity and ecosystems (Bartkowski et al., 2015; Farnsworth et al., 2015; Kedward, Ryan-Collins, & Chenet, 2022), are difficult to fully know and manage. “Biodiversity is a complex, multi-level concept, which includes genetic, species, functional, molecular and phylogenetic diversity, among others” (Bartkowski et al., 2015, p. 1). The measurement of biodiversity, as well as its relationship to the global economy, is highly controversial, if not limited.

This is what the first article of my thesis argues: there are limits to the substitution of risk for uncertainty. This article has the global ecological crisis as its common thread but engages with theories dealing with risk and uncertainty way beyond this object. It also has little regard for accounting as such as a reducer of uncertainty. After this article, I will thus articulate more clearly the relationships between accounting (for nature) and global (ecological) crises.

3.1.2 Introduction to Article 1: Substituting risk for uncertainty

The Final Declaration of the 1972 United Nations Conference on the Human Environment (or Stockholm conference) set the roots of the global ecological crisis in uncertainty: “[t]hrough ignorance or indifference we can do massive and irreversible harm to the earthly environment

on which our life and well-being depend” (United Nations, 1972, p. 3). Conversely, the reduction of uncertainty is viewed as the solution: “Through fuller knowledge and wiser action, we can achieve for ourselves and our posterity a better life in an environment more in keeping with human needs and hopes” (United Nations, 1972, p. 3). Since then, many efforts have been made to enable fuller knowledge and wiser action on the ecological crisis and its interactions with the global economy.

This article starts by stressing that international expertise, especially when it has an economic component, has historically dealt with the global ecological crisis as a set of predictable, usually quantified risks. This includes, for instance, the 1972 *Limits to Growth* report, some global assessments of biodiversity and ecosystems, NASA’s analysis of climate change, or economic reports in relation to the ecological crisis devised by international organisations and conservation organisations. They all claim to provide the tools that then enable reliable knowledge to be obtained for devising political decisions and actions out of a state of uncertainty, or, in other words, in or from a state of risk.

Political actors are indeed keen on using economic quantified data to justify their decisions and actions, even more so in a crisis situation (Maechler, 2021). Decision-makers are often asked to be able to cope with uncertain futures, while they are sometimes faced with the limits of their knowledge, with their own ignorance (Best, 2022). As Green (2018, pp. 247–248) points out in the case of climate change mitigation through carbon sinks, political actors prefer to “focus on what is knowable, assuming a world of risk”, rather than engaging publicly with a world of “unknown unknown”. By participating in the objectification of an uncertain future, the measure of uncertainty – turned into risk – would provide a guarantee of objectivity in public policies (Hibou, 2012; Vatin, Caillé, & Favereau, 2010). From such a perspective, any phenomenon is likely to be integrated into economic models, particularly cost-benefit analysis models that

relate the future to a present monetary value, providing clear data points on which decision-makers can support their decision and action. Although strongly criticised (Keen, 2020; Randall, 1988; Randalls, 2011; Spash & Hache, 2022), it is through these practices that (mainstream) environmental economists have historically addressed the global ecological crisis and its uncertainty.

The article argues and shows that international expertise, most particularly when it draws on mainstream economics assumptions, confusingly or even interchangeably uses the terms risk and uncertainty – in the sense that uncertainty is viewed as something prompt to quantification, computation, and anticipation. Uncertainty is thus considered a temporary state, pending new techniques and knowledge. This article starts with a strict distinction between uncertainty and risk. Uncertainty entails a situation or a phenomenon that is neither known nor quantifiable, and for which there is no reason, a priori, to believe that it should be otherwise in the future: “information, knowledge, and calculation techniques are considered as insufficient to assess or measure the future” (Maechler & Graz, 2022, p. 625). Conversely, risk can be anticipated, most often with the use of numbers. The distinction draws on heterodox economics, particularly post-Keynesian economists such as Dequech (1999, 2004, 2011) or Orléan (1987), as well as on the old institutional economist Frank H. Knight (1921):

“The practical difference between the two categories, risk and uncertainty, is that in the former the distribution of the outcome in a group of instances is known (either through calculation a priori or from statistics of past experience), while in the case of uncertainty this is not true, the reason being in general that it is impossible to form a group of instances, because the situation dealt with is in a high degree unique”. (Knight, 1921, p. 233)

Starting from such a distinction, the article argues that there are limits in the substitution of risk for uncertainty (as we shall see, the above-mentioned authors still believe in the possibility to

turn uncertainty into some sort of risk, despite such a distinction). These limits are firstly epistemic. They relate to the present and future knowledge deemed to be developed to face an uncertain future. The second limits are ontological. They refer primarily to the possibility to turn uncertainty into quantified probabilities, but also to the formation of collective expectations, including conventions, fictions, narratives, and stories. The article then engages with theories dealing with risk and uncertainty to discuss these limits. A table provides a mapping of the different approaches according to these limits: mainstream economics; heterodox international political economy and sociology; evolutionary political economy; and pluralisation of science – the latter being a proposal for facing uncertainty within these limits.

Mainstream economics, which is defined as “a systematic approach in social sciences linked to fundamental convictions about how markets depend on individual utility maximisation” (Maechler & Graz, 2022, p. 629), sees no epistemic nor ontological limits. For such an approach, uncertainty can always be quantified, whether it is today or in the future, while the judgment of experts, be it quantified, can also be considered a reliable political resource for projections. This category engages with how economists tried to reduce the complexity and uncertainty of the ecological crisis by measuring it as a set of monetary values. As the analysis will show, although this approach has been widely discussed and promoted in environmental conservation circles, it has not led to any action resulting in practical outcomes.

The article then presents a broad category ranging from heterodox economics, sociology, political science, and international political economy, which all share “a recognition of the subjectivity of social sciences in the wake of a post-positivist epistemology” (Maechler & Graz, 2022, p. 631). They all clearly distinguish between risk and uncertainty, in contrast to mainstream economics, and question the absence of epistemic limits. Yet, by putting forward

the role of conventions, the performativity of discourses, narratives, fictions, imaginaries, or various techniques of “governmentality”, they still consider that at an ontological level of analysis, the future can be anticipated.

The third approach, evolutionary political economy, which provides “explanations on the origins, developments and transformations of individuals and institutions” (Maechler & Graz, 2022, p. 633) is also consistent in clearly distinguishing between risk and uncertainty. To illustrate this approach, the article engages with and draws on Knight’s book *Risk, uncertainty and profits* (1921), which provides a seminal analysis of this topic from an evolutionary political economy perspective (Best, 2008; Dannreuther & Lekhi, 2000). Knight considers that some forms of uncertainty, the ones from which profits emerge, are not prompt to numerical measurements nor to various forms of collective expectations. For Knight, there are thus ontological limits in the substitution of risk for uncertainty. However, he sees expert judgement as a solution to turn uncertainty, or what he calls “true uncertainty”, is some sort of manageable risk. By relying on the higher judgement of experts, Knight sees no epistemic limit in the substitution of risk for uncertainty. It should be mentioned that Knight’s ambition was to find an answer to the conditions for the emergence of profit, which according to him, and others in the same period (Commons, 1934; Keynes, 1921), was to be found into how the uncertainty of the future was dealt with. By explaining that the origins of profit lie in true uncertainty, which can be dealt with “the best and wisest judgment” (Emmett, 2009, p. 43), it is also a political project of creating a world in which more profits can be made. Although Knight’s book has been written as a kind of textbook for business students and (future) entrepreneurs, his analysis of risk and uncertainty is still highly recognised in IPE and cognate fields for being “productive in assisting understanding of the fallacies of the ‘risk-based’ economic theory” (Clarke, 2021, p. 973).

Finally, the article proposes a fourth category that acknowledges both epistemic and ontological limits in the substitution of risk for uncertainty. Such proposition for a “pluralisation of science”, defined as “knowledge production processes aimed at overcoming disciplinary boundaries and better including lay and expert knowledge” (Maechler & Graz, 2022, p. 635) would not (only) rely on numbers, on collective expectations, nor on the higher judgement of experts, but rather be embedded in a collective co-production between science and society as for instance proposed by STS scholars (Callon, Lascoumes, & Barthe, 2001; Jasanoff, 2004; Latour, 2008), and others social scientists (Bäckstrand, 2003; Funtowicz & Ravetz, 1990; Graz & Hauert, 2019). This proposal takes IPBES, which is involved in global assessments of biodiversity and ecosystems, including in relation to nature valuation, as, on paper, a promising illustration of this pluralisation¹⁵.

It is worth noting that this article has been a collective, long, and still developing intellectual process. It is the result of many discussions since the very beginning of my thesis with Jean-Christophe Graz, which we continue to nurture with a clearer focus on the uncertainty of international crises. It is also the result of fruitful exchanges with students in the context of a Master’s class on risk and uncertainty held in 2018, which resulted in the very first version of this article, subsequently published as a working paper in *Les Cahiers de l’IEP* (see: Maechler et al., 2019). After this article, I will first briefly discuss the limits of the above article and then explain how it can be linked to accounting.

¹⁵ In my analysis (fourth chapter), I will suggest that the IPBES propositions of non-economic and non-market valuation of nature based on the integration of indigenous and local knowledge (IPBES, 2022) remain partly captured by the mainstream valuation discourse notably embodied into the second accounting world, that of natural capital accounting.

3.1.3 Article 1: Is the Sky or the Earth the Limit? Risk, Uncertainty and Nature

Maechler, S., & Graz, J.-C. (2022). Is the sky or the earth the limit? Risk, uncertainty and nature. *Review of International Political Economy*, 29(2), 624–645.

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Is the sky or the earth the limit? Risk, uncertainty and nature

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ABSTRACT

Dealing with uncertainty has become a matter of great concern for policy makers and scientific research in a world facing global, epochal and complex changes. But in essence, you cannot entirely predict the future. This article aims at conceptualizing the limits to anticipate the future – or what is often referred as the substitution of risk for uncertainty. In contrast to most theories examining risk and uncertainty, we start from the assumption that there are limits in the substitution of risk for uncertainty and that distinguishing between ontological and epistemic levels of analysis helps clarify such limits. The paper makes two arguments: first, most approaches see no ontological and/or epistemic limit in the substitution of risk for uncertainty; second, the pluralization of science is the only way to cope with limits in substituting risk for uncertainty. This second argument draws on the assumption that accounting for the uncertainty of the future depends on knowledge production processes able to overcome disciplinary boundaries and better include lay and expert knowledge. In times of great concerns regarding mitigation and adaptation to the ecological crisis, we illustrate our arguments with insights from global environmental governance.

KEYWORDS

Environment; expertise; global governance; measurement; ontology; pluralization of science; risk management; uncertainty

Introduction

'The scariest part is that we do not know what is going to happen. Everything is possible (...) Our future is totally unknown. I feel like I do not have control over it' (Massiot, 2019. 'Libération', our translation). Such emphasis made by the climate activist Greta Thunberg in a French newspaper reflects the larger issue of how we anticipate the full range of uncertainties arising from the ecological crisis, including biodiversity loss, ecosystem services degradation, local and global tipping points, and climate change. The same concern bears upon finance, security, or health issues as illustrated by the dramatic experience of the Covid-19 pandemic. To this end, large tracks of scientists and organizations have developed complex knowledge infrastructures to calculate uncertainty and reduce it into a risk. The concept of risk indeed describes a phenomenon that can be objectified, anticipated, and

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ultimately managed with numbers, in which future outcomes have known probabilities. This contrasts starkly with uncertainty: the concept involves a situation in which information, knowledge, and calculation techniques are considered as insufficient to assess or measure the future. While the substitution of risk for uncertainty thus appears as highly valuable, a question remains: are there limits in substituting risk for uncertainty and, if so, how to cope with them?

In the contemporary world, the prospect of reducing uncertainty and converting it into an objectified and quantified risk involves in one way or another the ability of states, markets and a flurry of non-state actors to shape the relation between economic and political spheres across borders. This is for instance how Blyth (2002) engages constructivist debates by emphasizing how agents' behavior derives from the uncertainty shaping their ability to identify their interest. Ultimately, the conceptualization of risk and uncertainty determines how scholarship in international political economy is likely or not to anticipate future events (Blyth & Matthijs, 2017). The few studies in international political economy specifically focused on the relationship between risk and uncertainty take a critical perspective on how the world is made 'more certain, controllable, and governable' (Deuchars, 2004, p. 2), as states, corporations and individuals all build on a common language of quantifiable risk in the context of globalization (Dannreuther & Lekhi, 2000). They focus on how the substitution of risk for uncertainty reflects a 'strategisation of time' (Lobo-Guerrero, 2014), depends on social conventions (Katzenstein & Nelson, 2013), and invents new institutions to 'absorb uncertainty into manageable risk' (Kessler, 2010, p. 119). With few exceptions, these studies see no limit in the conversion of uncertainty into risk. The same holds true for cognate fields of studies. In economics, a much greater number of prominent studies have examined the relation between markets, risk and uncertainty (Akerlof, 1970; Arrow, 1963; Friedman & Savage, 1948; Gollier, 2018). While varying in many respects, they all see the future as subject to a well-defined and objectified analysis (Reddy, 1996, p. 230). They thus take their distance from the divide between risk and uncertainty that Keynes (1921) and Knight (1921) pioneered a century ago. For their part, studies in economic sociology precisely take as object of their critical enquiry such limitless practices of turning anything at hand into a risk likely to be accounted in market terms (Fourcade & Healy, 2013; MacKenzie, 2006; Muniesa et al., 2007).

In contrast, this paper starts from the assumption that there are limits in the substitution of risk for uncertainty. In this context, distinguishing between ontological and epistemic levels of analysis helps clarify such limits. This distinction has already been made in one way or another in economic literature, in particular in post-Keynesian economics (Davidson, 1996) and in economics of conventions (Orléan, 1987). Moreover, as Dequech (2004, p. 375) points out, there is 'strong entwinement of ontology and epistemology' in this debate, as social reality and the production of knowledge remains entangled from a post-positivist perspective. Against this background, this paper sets out to analyze the limits in which risk can be substituted for uncertainty. The paper makes two arguments: first, most theories examining risk and uncertainty see no ontological and/or epistemic limit in the substitution of risk for uncertainty; second, the pluralization of science is the only way to cope with limits in substituting risk for uncertainty. The first argument is based on a critique of a large corpus of theories accounting for the future as a relation between risk and uncertainty.¹ The second argument draws on the assumption

that accounting for the future depends on knowledge production processes able to overcome disciplinary boundaries, and to better include lay and expert knowledge. In our view, international political economy literature would be well informed to consider such limits when analyzing the relation and substitution between risk and uncertainty. In times of great concerns regarding mitigation and adaptation to the ecological crisis, we illustrate our arguments with insights from global environmental governance and opposing responses to the relations between the economy, nature and society.

This article first provides some background on the case we draw from to illustrate our argument before turning on the theoretical framework used for our analysis. The three following sections analyze theories on the relation between risk, uncertainty and the future in mainstream economics, heterodox international political economy and sociology, and evolutionary political economy; they set to probe our first argument regarding the absence of ontological and/or epistemic limit in the substitution of risk for uncertainty. The last section focuses on our second argument and explains how the pluralization of science provides a promising avenue for understanding intrinsic limits in the substitution of risk for uncertainty. We conclude by coming back on our arguments and by suggesting further avenues for research.

Risk, uncertainty and the ecological crisis: on the importance of limits

While nature has long been viewed as the ‘ahistorical, stable and fixed stage of the changes triggered by humans and societies’ (Granjou, 2016, p. xi), the abrupt, complex and nonlinear changes related to the ecological crisis have shown that this is not the case. In 1982, the Organisation for Economic Co-operation and Development published a report about economic and ecological interdependence that already identified uncertainty as the major challenge of an ever more tangible ecological crisis: ‘uncertainty prevents us from understanding the possible evolution of natural phenomena’ (OCDE., 1982, p. 9, our translation). Since the ecological crisis is no longer a future possibility but a present reality, discourses have now changed and often use the concept of risk instead of uncertainty. This understanding of risk is basically the one used in the Global Risk Report published each year by the World Economic Forum (2020, p. 88). The insurance industry is another case in point. While insurers and actuary scientists are dealing with the impacts of the ecological crisis,² their *raison d’être* is to transform these uncertainties into fungible risks on which standardized economic transactions and commodified exchanges can take place (Graz, 2019, pp. 117–122; Lobo-Guerrero, 2011, p. 11). Beyond the insurance industry, various risk and sustainable management techniques support the ability of capitalism to face the ecological crisis (Levy et al., 2016; Ponte, 2019; Sharma & Soederberg, 2020).

These interrelations between quantitative risk governance and uncertainties generated by the ecological crisis are far from new. The report *Limits to Growth* was already an attempt to map, calculate, and model the biophysical ‘future course of human society’ (Meadows, 1972, p. 17). Similar anticipatory models drive the two largest global assessments ever made on the consequences of ecosystem change for human well-being: *The Millennium Ecosystem Assessment* (2005) and the reports of the *Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services* (see for instance its latest global report: IPBES, 2019). They both put great

emphasis on economic methods and quantitative reasoning in the range of anticipatory techniques and responses worked out to face the ecological crisis. So-called 'ecological risks' are illustrated by quantitative 'biophysical thresholds' or 'planetary boundaries' that could be exceeded depending on certain anticipatory scenarios and probabilities. These boundaries are defined by Rockström et al. (2009) as 'safe operating space for humanity with respect to the Earth system' (p. 472), so that thresholds can be clearly defined with the help of numbers.

A good case in point is the recent modelling of the future of the Greenland ice sheet through big data analysis made by the National Aeronautics and Space Administration (NASA). By putting 'the best physics possible in there' and building on 'datasets that help drive models', NASA scientists have transformed the uncertainty of 'how greenhouse gases may impact Greenland and us in the future' into a measurable and therefore manageable risk (NASA Goddard Space Flight Center, 2019). Scientists underline the yet unmanageable uncertainties arising from 'cascading dominos of feedback loops', such as 'the thawing and decomposition of carbon stored in permafrost [that] generates greenhouse gases' (Vonk & Gustafsson, 2013, p. 675). Yet, they still have good hope in our future technological capacities and intellectual performances to transform such phenomenon into a set of measurable risks. As we will see below, such a belief in the progress of our knowledge and techniques is largely counterproductive and prevents a real understanding and acceptance of a situation marked by unknowable uncertainties – and thus the ability to provide credible responses. It also highlights much confusion between risk and uncertainty – two notions that remain too often ill-defined. In a world facing global, epochal and complex changes, this prompts us to conceptualize the distinction between risk and uncertainty, the limits in the substitution of one by another, and the nature of such limits.

Drawing on Dequech (1999) and Reddy (1996), we understand uncertainty as a situation in which knowledge and information about a phenomenon is insufficient to allow our individual and collective cognitive capacities as well as our present calculation techniques to form any judgement or measure about the future. In this respect, a state of uncertainty can apply to our future technical and intellectual capacities to anticipate these uncertainties, so that we cannot simply rely on the hope of future progress. In contrast, risk refers to a phenomenon that can be objectified, anticipated, and ultimately managed with numbers, in which future outcomes have known probabilities. Against this background, the method used by policy makers and researchers for anticipating the future by substituting risk for uncertainty is a two-step process. First, it requires a classification of objects according to the available information and knowledge. Second, the calculation of probabilities. As Desrosières (2002) points out, 'these two processes – defining classes of equivalences and encoding – constitute the essential stages of statistical work' (p. 8). In other words, unknown events are first included into a frame of reference, and then probabilities and values related to their outcome are computed.

While some theories examining risk and uncertainty recognize some limits in substituting risk for uncertainty, only few distinguish between their ontological and epistemic levels of analysis. As seen in the introduction, such distinction echoes previous analyses in Post-Keynesian economics (Davidson, 1996; Dequech, 2004) and economics of conventions (Orléan, 1987). We refer here to the epistemic dimension to explore the production of knowledge that is used to anticipate the

future. An epistemic limit thus relates to an individual or collective inability to produce the required knowledge to turn an uncertain future phenomenon into a manageable risk. This is what Dequech (2004) appraises as the limits of ‘people’s mental abilities’ to anticipate the future (p. 368). At the ontological level of analysis, we focus on whether any kind of uncertain phenomenon that could occur in the future world can be assessed in such a way as to make it less ‘truly uncertain’. As Dequech (2004) points out, uncertainty is not only a matter of knowledge, but can also be ‘caused by, or described as, some properties of reality’ (p. 368). In our view, an ontological limit of substituting risk for uncertainty would exist if a distinct class of objects are defined as unfit for quantifiable probabilities and expectations about the future. In such cases, the inability to turn uncertainty into a well-defined set of instances (or into a set of risks) is inferred from the nature of such and such real phenomena, rather than from the development of the apposite knowledge. It would be for instance the characteristics of complex ecosystems as such rather than modelling techniques that would put limits on risk management exercises related to biodiversity.

The following sections use this theoretical framework to analyze how accounting for the future as a relation between risk and uncertainty is deemed to face such questions of limits. We will see differences at both the ontological and epistemic levels of analysis when it comes to ponder the limits in the substitution of risk for uncertainty. We will show that most theories examining risk and uncertainty do not set limits. Mainstream economics sees neither ontological nor epistemic limit in the substitution of risk for uncertainty. Heterodox international political economy and sociology adopts a critical stance regarding the tools and techniques of mainstream economics for uncertainty reduction. Yet, they see no ontological limit in the range of phenomena likely to be included by a society in order to substitute risk for uncertainty. We discuss a third school of thought as evolutionary political economy, in the wake of how Frank H. Knight (1921) analyzes ontological limits in the substitution of risk for uncertainty. We will see that his analysis of expert judgement to anticipate the future is tantamount to a lack of epistemic limit in the substitution of risk for uncertainty. Finally, the pluralization of science appears as the only way to consider both ontological and epistemic limits in the substitution of risk for uncertainty, as it depends on knowledge production processes that overcome disciplinary boundaries and better include lay and expert knowledge. Table 1 provides a mapping of these approaches according to the theoretical framework presented above. Each cell visualizes whether each of these four approaches considers any limit in the attempt to substitute risk for uncertainty, and if so, whether it privileges an ontological and/or an epistemic understanding of such limits.

Table 1. The limits in the substitution of risk for uncertainty.

Epistemic limits	Ontological limits	
	No	Yes
No	Mainstream economics	Evolutionary political economy
Yes	Heterodox international political economy and sociology	Pluralization of science

Mainstream economics: the sky as the limit

We refer here to mainstream economics as a systematic approach in social sciences linked to fundamental convictions about how markets depend on individual utility maximization, i.e. the maximization of the satisfaction received from consuming a good or service.³ Mainstream economics sees neither ontological nor epistemic limit in the substitution of risk for uncertainty (see Table 1). It assigns to calculation techniques the power to break down such limits. In predicting future courses of human behavior on earth, mainstream economics aims at transforming an unknown event into a manageable risk thanks to an ‘extraordinary faith in quantitative techniques’ (Morgan, 1991, p. 1). Such forecasting exercise is made of a mix of expert knowledge and mathematical tools based on the assumption that ‘either this world is *not complex*, or it is inhabited by people *with extremely powerful minds and/or computers*’ (Dequech, 2004, p. 370, emphasis by the authors). In the wake of the 1913 Nobel Prize for Physics William Thomson (1899), mainstream economics often considers that ‘when you can measure what you are speaking about, and express it in numbers, you know something about it; but when you cannot express it in numbers, your knowledge is of a meagre and unsatisfactory kind’ (p. 73-74). This also includes environmental economics literature developed since the 1970s and the following green growth discourses in their attempt to transform any ecological future into a present economic cost or benefit (Nordhaus, 2015; Pearce et al., 2006).

For mainstream economics, the measurement of utility is the core instrument to reduce uncertainty into numbers. As Moscati (2018, p. 1) points out, ‘over the course of the twentieth century, the concept of utility further expanded its reach and became the basis of attempts to analyze the economic decisions of individuals under uncertainty’. The development of the expected-utility theory has indeed aimed at explaining how individuals make rational choices in situation of uncertainty. It is based on the following motto: ‘choose the act with the highest expected utility’ (Briggs, 2017). While a large strand of expected-utility theory treats uncertainty as subject to an objective and probabilistic calculus of risk, other studies follow the subjective approach pioneered by Friedman and Savage (1948; see also: de Finetti, 1974; Savage, 1972). From this view, a probability is not about the frequency of an event in the real world. As Dequech (2011, p. 625) points out, it is about ‘a property of the way one thinks about the world’. Probabilities here derive from individual preferences. Be it subjective or objective, however, the risk is defined by a probability calculus that transforms uncertainty into a set of numbers. There is no ontological neither epistemic limit in the substitution of risk for uncertainty. And it is worth noting that such a way to calculate and anticipate policy preferences is not restricted to economics. It also feeds much debates in political science and environmental governance. The well-known ‘tragedy of the commons’ might indeed be solved by what Cashore and Bernstein (2019) call the ‘optimization school’, which treats ‘as objective the subjective belief that environmental issues matter more if they can be converted into economic [and thus quantitative] values’ (p. 11).

These quantitative techniques do not come out of nowhere. They rely on expert knowledge. Mainstream economics developed various methods to identify the best knowledge likely to ponder collective expert judgements. This includes ‘triangulation

strategies' to combine different methodologies in the exploration of a single phenomenon (Denzin, 1978, p. 291; Jick, 1979), the 'Delphi method' used to develop an opinion consensus from expert-driven questionnaires (Dalkey & Helmer, 1963, p. 458), or the 'rational consensus' developed by Cooke (1991, p. 81) to reach expert opinion in science. All these techniques build on mathematical procedures and models to weight experts judgement, such as 'long records (statistics) of experts' past performances' (Boumans, 2015, p. 177). Here, mainstream economics focuses in particular on the absence of epistemic limit in the capacity of experts and their theories to produce the tools and techniques to anticipate the future.

The same techniques are used by environmental economics, which also finds ways to reduce nature-based uncertainty by measuring it. Biodiversity, ecosystem services or greenhouse gases are all viewed as commensurable according to a price unit, what MacKenzie (2009) describes as 'making things the same'. Since the pioneer study of Costanza et al. (1997) that valued ecosystems at 33 trillions of US dollars of annual services to human beings, the growing importance of research on ecosystem services valuation led to the following leitmotiv in environmental studies: 'we don't protect what we don't value' (Myers & Reichert, 1997). This can be rephrased as 'we don't protect what we don't economically know'. The various methods to value nature in monetary terms are inspired by utility-based models, such as contingent valuation methods based on survey, in which individuals are asked about their preferences for environmental goods or services. As Skidelsky (2019) points out, these methods give economics 'a unique predictive power, especially as the utilities can all be expressed and manipulated quantitatively'. They homogenize the heterogeneity of nature on a quantitative basis and reduce ecological uncertainty in setting economic values.

The way mainstream economics conceives nature requires to put a value in the present on costs and benefits occurring in the future. In economic jargon, this is what discounting the future means. At the microeconomic level, this supposes setting a discount rate accounting for the degree to which we prefer present benefits (for instance money today) over future benefits (money in the future), what is commonly known as 'revealed time preference'. At the macroeconomic level, the discount rate sets the same type of preference, yet at the level of a defined community (Baumstark et al., 2005). Such uncertainty reduction in mainstream and environmental economics has been popularized since 2018 as William Nordhaus was awarded the Nobel Memorial Prize in Economic Sciences for his work on calculations techniques to estimate how much the present generation should invest in limiting climate change (Nordhaus, 2015). These discounting models are however often wrong and contested (Hickel, 2018; Keen, 2020), and built on previous assumptions and beliefs. One of the most contentious issue is that environmental economists generally use a positive figure – and a pretty high positive figure for Nordhaus – in their valuation of the present with regard to the future.⁴ This deters investment to quickly reduce our environmental impacts, as its costs would be much higher today than in the future.

In brief, mainstream economics sees neither ontological nor epistemic limit in the ability of probability calculus, expertise and mathematical modelling to substitute risk for uncertainty. As Reddy points out (1996, p. 230), this may even explain why mainstream economic scholars so often do not make any distinction between the terms risk and uncertainty – a remark which according to Blyth (2006) is also

valid for political scientists who ‘routinely confuse risk and uncertainty’ (p. 495). While this drives most debates in environmental governance, other approaches identified as distant from mainstream economics are also at pain in considering limits in the substitution of risk for uncertainty, whether ontologically or epistemically.

Heterodox international political economy and sociology: the how and the why of mastering the future

We examine here heterodox approaches on risk and uncertainty in international political economy and sociology. While we are well aware that heterodox is a category encompassing many different traditions, we take here a broad understanding that goes back to early debates surrounding the development of the field of international political economy: heterodox scholars at least share a recognition of the subjectivity of social sciences in the wake of a post-positivist epistemology and of what Murphy and Tooze (1991, p. 6) consider as the ‘variety of forms of historical and social explanations’ (see also the editorial of the first issue of RIPE: Amin et al., 1994). Theories discussed here all question the lack of epistemic limits presumed by mainstream economics in substituting risk for uncertainty. Few of them, however, see ontological limits in the range of phenomena likely to be subject to questionable methods of uncertainty reduction (see Table 1).

Arguably, the most abstract way these studies understand how capitalism responds to an uncertain future is based on what Beckert (2016) calls ‘imagined futures’. Anderson (2010) also identified imagination as one among other practices of anticipation, in which ‘future events, states of affairs, or persons are imagined “as if” they were actual or real’ (p. 785). German social theory is probably the most forward-looking on the concept of risk from this perspective. While Beckert recently explored the impact of imagined futures on the dynamics of capitalism – what is called the ‘sociology of expectations’ –, Luhmann’s ‘system theory’ (1986) also includes significant developments on the construction of risks and threats. Social systems are viewed as having increasingly internalized complex external threats as risks to be dealt with systematically – this is what Luhmann (2013, p. 78) calls the ‘security of expectation’. However, complexity theory just as complexity reduction always produces another layer of uncertainty. Beck (1986) drew on Luhmann to develop his analysis of risk society, which in a way just deals with this puzzle. If science is no longer synonymous of security and progress, it keeps producing the problems it was supposed to solve. This also prompts a shift in authority from governments to researchers and global firms in charge of ever developing new tools and techniques to reduce uncertainty. Beck (2006) extended his argument to argue that risk has become the defining feature of late modernity, since ‘modern society has become a risk society in the sense that it is increasingly occupied with debating, preventing and managing risks that it itself has produced’ (p. 332). His definition of risk emphasizes the importance of time, reversing ‘the relationship of past, present and future’ (2000, p. 214). Thus, the present is based on the past to build future risks. However, it is worth noting that Beck never really distinguishes between risk and uncertainty. Aradau and von Munster (2012) point out that Beck confuses risk and uncertainty, leaving the latter aside, since ‘uncertainty is merely the residual of risk, the incalculable leftover of risk

management' (p. 21).⁵ Like Luhmann, Beck thus sees epistemic, but no ontological limit in the substitution of risk for uncertainty as the production of another layer of uncertainty relies on previous substitutions of risk for uncertainty. Against this background, imagination, security of expectation or the embodiment of risk within society all allow to overcome the ontological limit in substituting risk for uncertainty.

Another strand of scholarship adopts a lower level of abstraction by considering that imagination is embedded in the real world through social conventions. Orléan (1987) recognizes the radical uncertainty of economic and market relations, but still finds ways to anticipate the future thanks to social conventions such as mimetic behaviors: 'when an individual has no criteria to discriminate between two opinions, rationality requires him to imitate a third party' (p. 163; our translation). Similarly, Chiappello (2015) provides a critical analysis of the financialization of valuation as a specific form of calculation. Here again, she explains how such mechanism is made possible through 'conventions used in order to pluralize the idea of economic quantification or monetary measurement' (p. 14) Another good case in point regarding the anticipatory power of such conventions is provided by Nelson and Katzstein's (2013) analysis of the 2008 financial crisis. In their view, finance lies in the world of uncertainty rather than risk, as economics, calculative practices and standards cannot foresee disasters. However, they argue that actors can still rely on social conventions to take their decisions, thus substituting risk for uncertainty. Katzenstein's further research with Seybert (2018) suggests that such ability to face an uncertain future brings into play a 'protean power', which 'results from the improvisations and innovations of agile actors and processes of the actualization of potentialities [...] coping with uncertainty' (p. 6). However, these conventions are not universal. They must be considered in their specific social context. It is worth to remind here Fourcade's (2011) prominent study on claims to compensation from damages resulting from large oil spills in the United States and in Europe. She explains not just how 'something that stands normally outside market exchange comes to be attributed an economic (monetary) value' (p. 1723); she also shows how such monetization of nature significantly differs according to distinct sociocultural environments on both sides of the Atlantic. Ultimately, conventions brought into play by different kinds of actors all allow to overcome the ontological limit in substituting risk for uncertainty.

Another strand of scholarship criticizing the lack of epistemic limits builds on Foucault to consider risk as a particular instrument of governmentality. It examines the performativity of discourses related to risk and the intrinsic dialectics between power and knowledge regarding the governance of the future. For instance, with a particular focus on the role of insurance as securing so-called 'liberal forms of life', Lobo-Guerrero (2014) emphasizes the importance of the 'strategisation of time', an abstraction process which 'projects into a future the technological reality of the model fabricating the uncertainties of their own scheme' (p. 366). From his point of view, knowledge on temporality allows for pushing 'the limits of insurability' (p. 356), and with it the limits of anticipation by the production of predictive models. In the same vein, Ericson et al. (2003) see uncertainty as an object of governance insofar as 'private insurance has come to constitute a vast behind-the-scenes system of informal governance' (p. 226). Many other scholars have written about risk as a technology of power and government to improve crime prevention

(O'Malley, 1992, 2003, 2008), to settle down the welfare state (Ewald, 1986, 1996), to govern environmental (Gouldson & Bebbington, 2007) or terrorism risk (Aradau & van Munster, 2007), and eventually to manage everything (Power, 2004). From such Foucault-inspired approaches, all risks are likely to be governed and ultimately anticipated – so that there is no ontological limit in the substitution of risk for uncertainty.

To sum up, similar analytical approaches are applied across many studies in heterodox international political economy and sociology to question the practices and underlying theories that assume no epistemic limit in the ability to reduce uncertainty in such a way as to make it an objectified, quantified and valuable risk. Few studies, however, see an ontological limit in the range of phenomena likely to be subject to such substitution of risk for uncertainty. To find such limit, we turn now to evolutionary political economy approaches. As we will see below, this will help us questioning the claim made by a large body of economic analysis to have the proper tools to transform any uncertain phenomenon into a set of quantitative risks.

Evolutionary political economy: the power of Knightian expert judgement in the face of true uncertainty

Evolutionary approaches presume that scientific knowledge aims at providing explanations on the origins, developments and transformations of individuals and institutions. They put great emphasis on processes and innovation, complex systems, and especially institutional dynamics (Dopfer, 2006; Hanappi & Scholz-Wäckerle, 2017). Two key thinkers stand out when it comes to dealing with the institutional dynamics that gears the political economy of uncertainty: John Maynard Keynes and Frank H. Knight. Both published in 1921 a book that will be celebrated for the next century.⁶ While Keynes' *Treatise on Probabilities* (1921) explored the links between calculability and the production of knowledge, Knight's *Risk, Uncertainty and Profit* (1921) forged new avenues for analyzing the relations between risk and uncertainty. Keynes conceives cases of 'radical' uncertainty and Knight of 'true' uncertainty. Both make a clear distinction between risk and uncertainty and find ways to reduce part of this unknown. However, only Knight sets a clear ontological limit in the attempt to substitute risk for uncertainty.

As pointed out by Shackle (1967), another key figure in evolutionary political economy, 'uncertainty was the new strand placed gleamingly in the skein of economic ideas in the 1930s' (p. 6). Keynes provided a simple definition of uncertainty in a famous article published in the *Quarterly Journal of Economics*: 'a matter for which there is no scientific basis on which to form any calculable probability whatever. We simply do not know' (1937, pp. 213–214).⁷ Best underlines that both Knight and Keynes 'saw economic decision making as based on conventional rather than perfectly rational thinking' (p. 364). Keynes' solution to face radical uncertainty is indeed based on the role played by social conventions in the 'intersubjective nature of economic activity' (Best, 2008, p. 364).⁸ In contrast, Knight distinguishes between three situations – risk, uncertainty, and true uncertainty – that not only gives us a detailed spectrum of the different forms of risk and uncertainty, but also attributes to knowledge the ability to overcome situations of so-called true uncertainty. With an emphasis on expert judgement, he sees no

epistemic limit in the ability to face such situations (see Table 1). However, as we will see below, Knight identifies a strong ontological limit in the ability of anticipating the future when this resembles situations of true uncertainty.

In *Risk, Uncertainty and Profit*, Knight (1921) explores how profit is generated in different situations of ‘partial knowledge’ (p. 199), developing various categories to secure ‘better knowledge of and control over the future’ (p. 260). These categories are represented in his well-known triptych: a priori probability, statistical probability and estimates of probability. A priori probability is used in a situation of entire rationality close to laboratory conditions, in which alternatives are homogeneously classified. However, he points out that we hardly find in practice really homogeneous classifications ‘in the sense in which mathematical probability implies, as in the case of successive throws of a perfect die’ (p. 246). For its part, statistical probability aims at objectifying a more uncertain situation, yet still considered by Knight to be a risk. It differs from a priori probability according to ‘the accuracy of classification of the instances grouped together’ (p. 217), i.e. heterogeneity versus homogeneity. Indeed, statistical probability can only be computed empirically, and not, as a priori probability, on general principles (p. 224). The next level of this triptych – estimates of probability – is an uncertainty, in which there is ‘no valid basis of any kind for classifying instances’ (p. 225). Yet, according to Knight, such situations can still be managed and transformed into statistical probabilities with the help of estimates of probability. It requires estimating ‘the given factors in a situation and also estimate the probability that any particular consequence will follow from any of them if present in the degree assumed’ (p. 214). Therefore, uncertainty describes situations in which complexity is still out of our frame of reference. Transforming undefined uncertainty into manageable risk then depends on quantitative tools and categorizations.

The core of the analysis driving towards an ontological limit lies in the difference that Knight draws between uncertainty and true uncertainty: ‘that higher form of uncertainty not susceptible to measurement and hence to elimination’ (p. 232). The entrepreneur, according to Knight, often deals with such situations of true uncertainty that call off quantitative reasoning and require ‘judgment’, ‘common sense’, or ‘intuition’ (p. 211). Knight thus sets an ontological limit in the substitution of risk for uncertainty, while recognizing the ability of expert judgment to reduce at least part of it. Against this background, he distinguishes between individuals facing true uncertainty and those having the skills to predict better than others (p. 241). In a nutshell, Knight considers that the future cannot always be dealt quantitatively, but that expert judgement can compensate for that. He sees such knowledge in the hands of smart entrepreneurs and consultants, thus able to overcome the epistemic limit to substitute risk for uncertainty.⁹

Pluralization of science: earth as the limit

We have seen so far that most theories examining risk and uncertainty see no ontological and/or epistemic limit in the substitution of risk for uncertainty. We now probe our second argument according to which both the ontological and epistemic limits exist in the substitution of risk for uncertainty (see Table 1). This second argument draws on the assumption that accounting for the uncertainty of the future depends on what we call here a pluralization of science, which describes

knowledge production processes aimed at overcoming disciplinary boundaries and better including lay and expert knowledge.

We are not short of studies that point out the co-production of science and society, while acknowledging the power of expertise as a mean of control over the material world (Jasanoff, 2004; Latour, 1993; Pestre, 2013). As Jasanoff suggests (2004, p. 3), scientific knowledge is embedded in ‘social practices, identities, norms, conventions, discourses, instruments and institutions’. Under the apparent technicality of the subject and the neutrality of science, decisions of experts escape democratic debate although they engage our common future. In the same vein, Latour (2017) recently underlined in the context of the twin globalization and ecological crisis the importance of ‘*multiplying* points of view (...) taking into account a greater number of beings, cultures, phenomena, organisms and people’ (p. 23, our translation). Callon et al. (2001, p. 36) view in ‘hybrid fora’ a device to address scientific controversies in exploratory spaces open to heterogonous groups, knowledge and experiences. These hybrid fora challenge both knowledge production captured by experts, as well as scientific representation captured by elected politicians. Graz and Hauert (2019) developed the concept of ‘pluralization of knowledge’ that reflects such a need ‘to reach out to a broader pool on an ad-hoc basis’ in order to ‘look for cognitive resources on a much more heterogeneous basis’ (pp. 15–16). In contrast to Callon and his co-authors focused on regime of controversies, they provide ‘insights for an in-depth understanding of the co-production of socio-technical knowledge’ (Graz & Hauert, 2019, p. 10). In the following analysis, we draw from these accounts to examine how the pluralization of science is a promising avenue to cope with limits in substituting risk for uncertainty at both ontological and epistemic levels of analysis. We start with the need to overcome boundaries of disciplinary knowledge and follow with the need to better include lay and expert knowledge.

The first aspect of pluralization of science relates to interdisciplinarity. According to Miller (2010, p. 1), knowledge production has become ‘less effective due to disciplinary fragmentation’. Similarly, Epstein (2019) underlines the disadvantages of specialization in addressing wicked environment problems where not all information is available to make a decision. This mostly reflects a lack of interdisciplinarity related to the outcome of individual skills in different fields. However, a pluralization of science depends on a form of interdisciplinarity that also relies on the various experiences of a broader range of stakeholders. From this view, it is mainly a collective process. It is in this context for instance that Cashore and Bernstein (2019) are calling for a scholarly ‘Marshal Plan’ that would include many fields of critical social sciences. They underline that such a collaboration would be of particular help to address the challenges posed by climate change and ongoing massive species extinctions (p. 1). The Delphi method discussed above had similar inputs regarding interdisciplinarity and collective decision-making, by indicating that ‘several heads are better than one in making subjective conjectures about the future’ (Weaver, 1971, p. 268). Yet, this method still recognizes the superior role of specialized knowledge seen as able to ‘make conjectures based upon rational judgement rather than merely guessing’ (p. 268). It is worth noting that Haas (2017) – well known for his concept of epistemic communities – still considers today that the knowledge produced within the confines of a discipline bears the highest expectations: ‘panels with expertise based on disciplinary

credentials proved more influential than those with more open-ended experts from civil society' (p. 62).

In addition to embracing many disciplinary fields, a pluralization of science also builds on the ability to better connect lay and expert knowledge. In this sense, it reflects a form of civic science, which Bäckstrand (2003, p. 25) describes as 'enhancing public understanding of science, increasing citizen participation, diversifying representation in, and promoting democratization of science'. A good case in point regarding such pluralization is the study of Funtowicz and Ravetz (1994) on the democratization of knowledge required for a proper understanding of songbirds' contribution to nature – what they call a 'postnormal science'. Such postnormal science requires more than one discipline in the analysis of a complex phenomenon, and the extension of the knowledge production process to lay actors concerned by the issue at stake. From a different perspective, de Sousa Santos (2018) recently made a comprehensive critique of the 'epistemologies of the North' valuing expert and scientific knowledge and emphasized the need for a shift towards 'epistemologies of the South' valuing plural knowledge based on a move from 'knowing-about' to 'knowing-with'.

As a way of illustration in the field of global environmental governance, we can draw on a growing number of international initiatives and platforms that aim at including such diversity of knowledge within their knowledge production processes. The Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) is a good case in point.¹⁰ The IPBES recently claimed to include a larger range of actors for efficient biodiversity and ecosystem services assessment and related valuation (Dunkley et al., 2018; Vadrot, 2014). Its reports recognize both the diversity of nature's values on the one hand – including non-quantitative forms of valuation – and the plurality of forms of knowledge on the other – including 'governments, civil society organizations, and indigenous people and local communities' (IPBES, 2018, p. 30). Yet, a gap remains between the discourse (or even the will), and the practice of including a more heterogeneous basis of knowledge into mainstream science. This concerns both the question of interdisciplinarity and the ability to take indigenous and local knowledge aboard (Hughes & Vadrot, 2019); it also applies for the politics of natural disasters and the involvement and production of knowledge of the United Nations Office for Disaster Risk Reduction (UNISDR) (Revet, 2018). Studies point out that the IPBES failed 'to find ways of dealing with contrasting rationalists, diverging ontologies and different criteria for knowledge validation' (Dunkley et al., 2018, p. 794). Brand and Vadrot (2013) draw on the concept of epistemic selectivity to explain such a phenomenon of 'knowledge–power nexus' where political institutions privilege particular forms of knowledge over others. From such perspective, some consider that the IPBES needs 'to open up procedures and practices of participation and inclusion in order to accommodate pluralism, contestation and incommensurable perspectives and knowledge systems' (Díaz-Reviriego et al., 2019, p. 457). For instance, while the United States advocated a so-called science-driven process focused on ecosystem services, valuation and quantification; Bolivia was firmly opposed to 'the ecosystem framing and sought greater plurality of worldviews represented' (Hughes & Vadrot, 2019, p. 30). In the domain of climate diplomacy, Belfer et al. (2019) and colleagues also showed that the actual involvement of indigenous peoples remained limited. Ultimately, such a difficulty of combining different and sometimes incommensurable

modes of knowledge also relates to actors' different understandings of risk and uncertainty, which may subsequently shape their policy preferences.

Finally, a pluralization of science that emphasizes both ontological and epistemic limits in substituting risk for uncertainty sheds light on the incompleteness of knowledge. We just do not know whether all the necessary knowledge is included, beat across existing scientific disciplines or across lay and expert knowledge. Overall, many challenges remain regarding a proper pluralization of science, as well as a recognition of the ontological and epistemic limits in the substitution of risk for uncertainty.

Conclusion

In a context of global, epochal and complex changes, this article has examined the ability to anticipate an uncertain future, with insights from global environmental governance and opposing responses to the relations between the economy, nature and society. It contends that a distinction must be made between risk and uncertainty, as well as between ontological and epistemic levels of analysis, and therefore set or not set ontological and/or epistemic limits in substituting risk for uncertainty. From this assumption, the analysis has shown, first, that most theories see no ontological and/or epistemic limit in the substitution of risk for uncertainty; second, that the pluralization of science is a more promising avenue to cope with limits in substituting risk for uncertainty. Mainstream economics sees neither ontological nor epistemic limit in substituting risk for uncertainty. Studies in heterodox international political economy and sociology, for their part, question such lack of epistemic limits, while reproducing somehow a 'no limit ontology' in the range of phenomena subject to their critique. We have furthermore drawn on Knight's concept of true uncertainty to suggest that, from an evolutionary political economy perspective, there are ontological limits in the substitution of risk for uncertainty. Yet, such an approach confers on expert judgement the ability to overcome the epistemic limit. The pluralization of science shows that accounting for the uncertainty of the future depends on knowledge production processes better able to overcome disciplinary boundaries and include lay and expert knowledge. However, many challenges remain for a proper application of a pluralization of science, one of them being the hegemony of a particular form of knowledge over others. Therefore, this article suggests that international political economy scholars would be well informed to consider the question of limits as well as the nature of such limits when analyzing how uncertainty is reduced.

This ultimately leads to take the question of the incompleteness of knowledge seriously, as both our individual and collective capacities to anticipate the future by substituting risk for uncertainty are limited. A first avenue for future research concerns the burgeoning studies on resilience. This question of limits may clarify existing debates on the use of the concept of resilience to appraise the ability of societies to face unexpected events and on how such policies are likely to take power issues onboard. While some scholars take a critical stance on the overall relevance of the concept viewed as a product of contemporary neoliberalism (Bourbeau, 2018; Felli, 2016; Phelan et al., 2013; Walker & Cooper, 2011), others argue that it provides interesting insights to reflect on our limits to anticipate the future. According to Holling (1973), a pioneer on ecological resilience, this may

even be close to what we describe here as pluralization of science: a resilience approach ‘would emphasize the need to keep options open, (...) heterogeneity [and] the recognition of our ignorance’ (p. 21).

A second course of future analysis relates to research undertaken under the umbrella of future studies – particularly relevant when analyzing the knowledge used to govern environmental futures (Granjou et al., 2017). For instance, scholarship on anticipatory action and governance underlines the political and contested nature of uncertainty reduction strategies, albeit without explicitly distinguishing between ontological and epistemic dimensions, let alone the existence of intrinsic limits in such exercises (Aykut et al., 2019; Guston, 2014). Similarly, Anderson (2010) deconstructs the styles, practices and logics through which the future is disclosed, yet without taking into account the ontological limits that face what he sees as a proliferation of anticipatory action. Engaging the resilience and anticipatory action and governance literature could help specifying how such policies are justified, legitimized, and contested beyond grand narratives.

Finally, there is ample space for generalizing the argument made on the pluralization of science. A thorny question in this regard is the limits that the advocates of ‘citizens science’ could face in the demand to further extend the scope of what we call here the pluralization of science (Irwin, 1995; McKinley et al., 2017). Moreover, globalizing the pluralization of science brings to mind the decolonial turn in international relations (Mantz, 2019; Seth, 2011). Yet, it also raises broader and, arguably, more urgent concerns, as it is less a matter of disciplinary identity than how to face the global ecological crisis within the constraints of a just transition (Morena et al., 2019). This question is particularly urgent in the context of the Covid-19 crisis and its both global and local socioeconomic and political consequences. International political economy scholars have here a fertile ground for research on how unexpected events are disrupting the present and creating the future – while taking into account the question of limits when analyzing how the future may be anticipated. Arguably, exiting such crises cannot be done without better linking up with the ‘degrowth movement’. Indeed, degrowth first calls for a greater democratization of decision-making processes as it applies a pluralization of science for many other teleological positions and other utopias than environmental sustainability, such as issues of class, race and gender (Parrique, 2020). In addition, degrowth makes particular emphasis on the question of limits, and as Kallis (2019, p. 1) recently underlined, ‘Western culture is infatuated with the dream of overcoming limits’.

Notes

1. We are well aware that theories discussed in this article do not exhaust accounts on risk and uncertainty in social sciences. They only account for what we see as the most relevant interdisciplinary and pluralist corpus for the puzzle of risk and uncertainty in IPE debates.
2. Insurance losses from natural disasters were estimated at 219 billions of US dollars between 2017 and 2018, ‘the highest-ever for a two-year period’ (Swiss Re Institute, 2019).
3. We are aware that the distinction between mainstream and heterodox has fed much debates without necessary much clarity about the criteria defining one or the other (Jo et al., 2018). It includes at its core neoclassical orthodoxy, but also extends to Sylvain Maechler, PhD thesis

behavioral economics and with some variations, a number of other schools of thought (for further details, see: Dobusch & Kapeller, 2012).

4. Costanza and his colleagues who did the first global monetary assessment of nature's value used a discount rate of 5% in order to convert stock values into annual flows. Such a rate of conversion was crucial to reach the final figure of 33 trillion of US dollars for the annual services provided by ecosystems for human beings. This is slightly more than Nordhaus' average 4.3% used in his modelling, and clearly more than Stern (2006) in his review of the economics of climate change, using a discount rate of 1%.
5. In the same vein, Ericson (2005, p. 660) points out that 'Beck should have called it the uncertain society because his focus is on potential and actual scientific and technological disasters that have proven unpredictable and entail immeasurable human suffering'.
6. See the forthcoming special issue of the *Cambridge Journal of Economics* provisionally entitled 'Keynes' *Treatise on Probability* and Knight's *Risk, Uncertainty, and Profit After 100 Years* (Editors: Phil Faulkner, Alberto Feduzi, C.R. McCann, Jr, Jochen Runde).
7. The whole quote is the following: 'By "uncertain" knowledge [...] I do not mean merely to distinguish what is known for certain from what is only probable. The game of roulette is not subject, in this sense, to uncertainty; nor is the prospect of a Victory bond being drawn. Or, again, the expectation of life is only slightly uncertain. Even the weather is only moderately uncertain. The sense in which I am using the term is that in which the prospect of a European war is uncertain, or the price of copper and the rate of interest twenty years hence, or the obsolescence of a new invention, or the position of private wealth-owners in the social system in 1970. About these matters, there is no scientific basis on which to form any calculable probability whatever. We simply do not know" (J. M. Keynes, 1937, pp. 213–214).
8. To some degree, he could even be related to the heterodox approaches in international political economy and sociology seen above, since no ontological limits seem likely to arise in such transformation of uncertainty into risk.
9. John R. Commons' concept of 'futurity' would also deserve further analysis in the wake of his observations that 'man lives in the future but acts in the present' (1934, p. 58). Basically, Commons sees no epistemic limit if rights – or 'the collective working rules of society' – are properly negotiated between the parties concerned to provide a 'security of expectation'. The recent best-seller co-authored by Mervyn King, former Governor of the Bank of England, reaches somehow similar conclusions in considering that eventually creative business, political and personal strategies are better than number to cope with radical uncertainty (Kay & King, 2020).
10. The official aim of the IPBES is to provide Governments, the private sector, and civil society with scientifically credible and independent up-to-date assessments of available knowledge to make informed decisions at the local, regional and international levels.

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3.1.4 Discussion: Accounting standards and the pursuit of objectivity

The above article is intended to be thought-provoking, especially when it comes to classifying each research stream into four categories that are implicitly presented as impervious to each other. While some of the examined scholarships may sometimes be crossed between different categories¹⁶, this is especially true when it comes to dealing with uncertainty in practice. Indeed, actors are most often actually making sense of uncertainty through a mix of numerical measurement, expert knowledge and judgement, against which they also mobilise their past beliefs, social conventions, and expectations. In other words, actors facing uncertainty mobilise a variety of strategies to reduce it, sometimes even acknowledging that it cannot entirely be reduced (Best, 2022). Even one instrument, such as accounting, is engaged in various ways in the substitution of risk for uncertainty. This is what I will look at here.

Accounting is linked to uncertainty reduction, or, more precisely, entails an engagement with an uncertain future (Mouritsen & Kreiner, 2016; Mügge & Stellinga, 2015). This is by looking at the accounting figure, among other things, that international actors are used to claiming reliable knowledge for decision and action in a situation marked by economic uncertainty. As explained by Mügge and Linsi (2020, p. 404), the accounting figures, in this case, GDP, “are the bedrock of economic policymaking and debate. They allow computation, comparison, historical analysis, and future forecasting. Without such data, ‘the economy’ would remain an intractable abstraction for policymakers, citizens, and analysts alike”.

¹⁶ One can think, for example, of Beckert’s concept of “fictional expectations” (2016), which could also in some ways have been placed alongside Knight and the evolutionary political economy school of thought, as these fictional expectations rely heavily on personal judgement, in a way that is close to that proposed by Knight for managing true uncertainty. However, Beckert’s “fictional expectations” is also, and above all, related to narrative and stories, which brings it closer to the category that sees no ontological limits in the substitution of risk for uncertainty.

As will be detailed in the analysis, accounting for nature is thus not only a question of calculations and expert knowledge, but also of narratives, metaphors, and social expectations. Traditional accounting¹⁷ as well is not only about calculations, although it is true that just like mainstream economics, accounting has been developed based on a “trust in numbers” – to borrow an expression from Porter (1996). Before his seminal work on the appeal of numbers in contemporary societies, Porter (1992) examined specifically the development of international (financial) accounting standards in the 1960s, a time when the contemporary financial accounting architecture was being developed (Zeff, 1999), before the major breakthrough of the early 2000s and the creation of the IFRS Foundation (Perry & Nölke, 2006). This development, Porter explains, has been driven by the ideal of natural science and the pursuit of objectivity based on quantitative rules and principles – not unlike mainstream economics thought (Morgan, 1991). As Porter explains, the quantification rules proposed by accountants involved in early standardisation exercises draw on “empirical, meaning statistical, research, and on this account it became the consensus concept of objectivity in accounting” (1992, 639). From the very beginning, accounting, including in relation to nature, is indeed engaged in objectifying a complex reality through quantification rules, themselves incarnated by standards. As “the values against which people, practices and things are measured” (Loconto & Busch, 2010, p. 526), standards are central to accounting, as they are by extension to uncertainty reduction (Graz, 2019, pp. 117–122). This attempt to govern the global politics of the ecological crisis through standards is at the heart of accounting for nature, regardless of the accounting world under consideration. The success of an accounting method for nature could even be judged by its ability to provide usable (and used) standards.

¹⁷ Here, accounting, and the standards on which it is based, are approached at a high level of abstraction, in that they are seen as a general set of tools for recording and projecting economic and financial processes, with no formal distinction between public and private accounting, as will be the case latter in the analysis.

The “accounting ideal”, explains Porter, embodied into standardisation of accounting rules and methods, “replace[s] arbitrariness, idiosyncrasy and judgment [that prevailed before accounting standardisation] by explicit rules” (1992, 633). From this perspective, the role of accounting standards is to limit the superiority of what he calls “the old accounting élite”, which beforehand used its own judgement, close to Knight’s interpretation, to make sense of non-standardised accounting figures. Standards, in contrast – and if used correctly –, are supposed to protect the “outsiders in accounts” (T. M. Porter, 1992, p. 638).

While the critical accounting scholar Power explains that “Knightian uncertainties become risks when they enter into management systems for their identification, assessment and mitigation” (Power, 2007, p. 5), evolutionary political economy approaches would consider that quantitative standardisation is powerless against higher forms of uncertainty. It only helps deal with some specific categories of uncertainty, the ones that can be turned into numbers. For Knight, it is not by looking at the accounting figure that actors would make sense of an uncertain future, or, from his own reasoning, make profits. The latter only emerge from the higher judgement of experts, not from quantitative reasoning. As mentioned above, the reality is probably more complex, not black, or white, only epistemic or ontological. Decisions and actions based on accounting always require judgement (Colasse, 2012; Mouritsen & Kreiner, 2016; Puroila & Mäkelä, 2019). Experts thus continue to be in a position of “superiority” compared to lay people. Accounting, despite standardisation, and like most other quantification, valuation, and commensuration instruments, is a “black box” that favours an informed elite (Mennicken & Espeland, 2019). This is especially true since accounting standards, especially financial accounting ones, are literally a representation of what an elite wants to see (J. J. Young, 2006), as will be further discussed in the context of the third article of the thesis (Maechler 2022). As heterodox international political economy and sociology approaches

would argue, accounting is a social construct reflecting a series of judgements that starts from the setting of standards (Aragão & Linsi, 2022; Mügge, 2020; Ramirez, 2013). This subjective feature of accounting continues with the collection of data reliable to be accounted for, which, according to Puroila and Mäkelä (2019), involves professional and personal opinions that even standards cannot contain. From their design to their use, from their implementation to their enforcement, accounting standards are far from being close to a pluralisation of science (Maechler & Graz, 2022)

I have already highlighted that accounting does not provide an objective representation of the world, in the sense that it is not simply objectifying a pre-existing reality (Chiapello, 2008). This is also true for accounting for nature. Faced with the limits in the substitution of risk for uncertainty, it focuses only on precise, pre-defined ways to reduce uncertainty. As shown by Allison in a totally different context, namely the Cuban missile crisis, uncertainty can be managed by “estimat[ing] the probability of future occurrences”, but also by avoiding it (Allison, 1969, pp. 701, 700). This is precisely a fundamental criterion of distinction between the different accounting worlds. While the first two of them aim at avoiding uncertainty by mitigating risks, or mitigating environmental impacts, the latter, that of accounting for nature-related risks, aims at managing those risks. They thus propose different political paths to reduce, or deal with, the uncertainty of the global ecological crisis. Below, I present other criteria through which I distinguish between the three accounting worlds, based on Boltanski and Thévenot’s concept of common worlds.

[3.2 From common worlds to accounting worlds](#)

The terminology of “accounting worlds” is a reference to Boltanski and Thévenot’s “common worlds” that they present in their book *De la justification. Les économies de la grandeur* (1991),

then translated into English with the title of *On Justification. Economies of Worth* (2006). The aim of this sub-chapter is to help understand the diversity of accounting for nature, embodied into three “accounting worlds for nature”, or “accounting worlds”. More than the above, this theoretical framework has been developed throughout the thesis. I have been able to conceptualise these three accounting worlds through the back and forth between empirical data collection, analysis, and theory. Consequently, the three sub-cases that will be presented in the next methodological chapter echo the three accounting worlds conceptualised here and then analysed, discussed, and further compared in the fifth chapter.

At a meta-theoretical level, the concept of common worlds draws on a pragmatic sociology approach that allows understanding “the ways in which people engage in action, their justifications and the meaning they give to their actions” (Boltanski & Chiapello, 1999, p. 34, my translation). This theoretical framework is thus relevant for my research goal of exploring the concrete practices of actors developing such or such accounting methods for nature. Boltanski and Thévenot explain that actors mobilise different “orders of worth”, which are embodied in a set of “higher common principles” that “belongs to and exists in one common world [but] may be unknown in a different world” (Boltanski & Thévenot, 2006, p. 131). They explain that for justification and thus consensus to work, shared orders of worth are needed, which initially do not exist between common worlds. Boltanski and Thévenot then distinguish six different “worlds” that precisely draw on different orders of worth: the inspired world, the domestic world, the world of fame, the civic world, the market world, and the industrial world (2006, chapter 6).

I find Boltanski and Thévenot’s approach very enlightening to understand the diversity of accounting for nature embodied into three accounting worlds defined as groups of actors

devising accounting methods and standards for nature, driven by a set of higher principles about the global ecological crisis and the means to remedy it. As we shall see, widely shared “orders of worth”, based on such a set of “higher common principles”, are precisely not commonly found between the three accounting worlds. Each of the three remains mostly impervious to what is going on in the other accounting worlds as they address a specific audience that shares more or less the same views on the ecological crisis and the means to remedy it. One exception is perhaps the second accounting world, that of natural capital accounting, which succeeded, to some extent, in mobilising a larger audience than its initial group. This is also the reason why another concept will be used to understand this accounting world, i.e., the one of capitalocentrism, which I will present below.

The higher common principles operating in each common world are, among other things, embodied into “a convention for establishing equivalence among beings [which...] stabilizes and generalizes a form of association” (Boltanski & Thévenot, 2006, p. 140)¹⁸. Applied to accounting for nature, such a convention for establishing equivalence, or *equivalence convention*, allows translating the diversity of nature into common metrics. Close to such “common worlds” framework, the economics of conventions (Diaz-Bone, 2017; Eymard-Duvernay, Favereau, Salais, Thévenot, & Orléan, 2006; Mennicken & Salais, 2022) or Desrosières and its sociology of quantification (2008a, 2008b), have shown that the production of quantitative and objective evidence relies on the collective development of measurement conventions, categories, taxonomies, and classifications, or “agreed international methods and definitions [...] that translates social or natural phenomena into statistics or other numerical

¹⁸ More precisely, Boltanski and Thévenot explain that a higher common principle “is a convention for establishing equivalence among beings. This convention stabilizes and generalizes a form of association. It ensures that beings are qualified, qualification being the condition for assessing *objects* as well as *subjects* and for determining the way in which they matter, objectively, and have value beyond any contingencies. We can say that ‘a’ is the equivalent of ‘b’ in terms of some higher common principle: for instance, ‘in terms of fame, person X is more important-matters more than person Y.’” (Boltanski & Thévenot, 2006, p. 140-41).

information” (Cussó & Piguet, Forthcoming, pp. 236, 232). The diversity of accounting for nature is thus also embodied in a diversity of equivalence conventions that turn nature into different forms of accounting units and metrics. We will see that some of these equivalence conventions are, for example, considered to be more “scientifically robust” or “objective” within an accounting world, while others are considered to be more attractive for compelling economic actors to engage in environmental conservation, in particular the monetary equivalence convention.

Thévenot and Lafaye (1993) have applied such a theoretical framework to the challenges of the ecological crisis to identify, in addition to the already conceptualised six worlds, an additional “ecological world”. Yet, they have emphasised the limits of placing ecological arguments in their register of justification. In environmental debates, they explain, actors most often use arguments based on the different orders of worth that already exist. Actors rely on the “long-established figures of the common good” (Lafaye & Thévenot, 1993, p. 496, my translation). In other words, and using another concept, each world makes sense of the ecological crisis based on its own already existing repertoire and is engaged in some form of “bricolage” based on the latter (Carstensen, 2013). Godard is probably the one who has done the most work on applying the framework of common worlds to what he calls “environmental problems” (Godard, 1990, 2004). As he explains, “the plurality of orders has an obvious consequence, which is to construct different concrete worlds. There is no longer a single, unambiguous way of describing nature and the environment. Each order of worth has its own representation of nature” (Godard, 2004, p. 310, my translation). This leads him to reflect on how the six common worlds perceive nature, the ecological crisis or, in his words, global environmental problems.

While it is possible to relate each of the three accounting worlds to one, two, or even three of the six “common worlds”, particularly in the way Godard has applied this framework to nature and environmental problems, we shall see that at the exception of the third accounting world, that of accounting for nature-related risks which clearly relates to the “market world”, or what Godard (1990, 2004) calls the “market nature”, the two others are hybrids, drawing on orders of worth and higher principles from different common worlds as distinguished by Boltanski and Thévenot. I will discuss each of the accounting worlds in relation to this typology of common worlds at the end of the fifth chapter, in the discussion of my findings.

I also mobilise another concept to further distinguish between the accounting worlds, which is the one of political entrepreneurs. Although accounting for nature is an eminently technical domain requiring specialised expertise, the development and dissemination of accounting tools beyond their accounting world require that they be translated into motivating formulas and stories that can be used to promote their widespread adoption. This process calls on other skills. The various actors involved thus play a variety of roles, which I, therefore, analyse using the concept of this “political entrepreneur” that is frequently used in political economy analyses of global environmental governance, as shown in the second chapter (Andonova, 2017; Green, 2014). This term refers to individuals who are capable of proposing and/or influencing decisions, and of translating an idea into policy innovations and practices (Mintrom, 2019). I distinguish two types of policy entrepreneurs while recognising that the two categories are permeable, given many actors’ hybridity and multiple positioning. The first are “technical entrepreneurs”, who contribute to the development of knowledge, working at the science-politics interface, working primarily on quantification conventions and recognising the reductionism of translating the complexity and diversity of nature into single metrics. The second are “meaning entrepreneurs” (Maor, 2017), who are capable of giving this technical

knowledge a broader meaning and translating it into “simple but powerful ideas” (Lordon, 2000, p. 185). We will see that some accounting worlds rely almost exclusively on one type of political entrepreneur, which, in a way, may explain the difficulties of their methods and standards to be used in practice.

We will see that each of the three accounting worlds outlines a distinct framework for regulating and governing the relationship between capitalism and nature. In contrast to regimes (Chiapello & Walter, 2016; Pestre, 2006), we shall see that they do not follow some sort of successive historical sequences, even if they appeared at different times, in different places, and are presented in chronological order in my analysis in the fifth chapter. A table at the end of chapter five will provide a clearer distinction between the three accounting worlds based on some of the above-mentioned concepts. In particular, I will define what “nature” each of the accounting worlds refers to, and which “higher common principles” are prevalent in each. For instance, the third article of the thesis, largely dedicated to the third accounting world of accounting for nature-related risks, shows that financial accounting standard-setters are referring to nature as a sole parameter for investors’ financial return, as a financial risk, drawing on their already established order of worth, beliefs, and worldviews (Maechler, 2022). In this article, I draw on the concept of financialisation, which can be defined as the way “shareholder value”, as a set of higher common principles, is extended by those financial actors to new domains of political life (Erturk, 2020; Ortiz, 2021; van der Zwan, 2014).

As already mentioned, this “common worlds” framework does not sufficiently help explain why one accounting world in particular, that of natural capital accounting, embodied into the larger project of nature valuation, has been the most successful for being widely diffused in environmental conservation discourse, without ever being translated into concrete (accounting)

practices – except that it may imprint modes of justification to different common worlds. To this end, I discuss here J.K. Gibson-Graham’s concept of capitalocentrism, through which I coin the one of valuation-centrism.

3.3 From capitalocentrism to valuation-centrism

The use of accounting as a response to the global ecological crisis, most notably when it is embodied in natural capital accounting, should be understood in the broader context of the centrality of valuation in environmental conservation discourse (Dempsey, 2016). By drawing on Gibson-Graham’s concept of capitalocentrism, I intend to fill a gap in the existing literature on nature valuation presented in the second chapter, namely why nature valuation continues to figure so prominently in conservation policy narratives despite its lack of practical outcome. To this end, I have coined the concept of “valuation-centrism” through which I describe a system of discourse and knowledge that subverts all exit strategies from the ecological crisis into valuation practices, that reinforces hegemonic capitalist representations of nature, and that thwarts the imagining of “other natures”.

J. K. Gibson-Graham is the pen name of Katherine Gibson and the late Julie Graham, under which they outlined their diverse economies research agenda in a 1996 book entitled *The End of Capitalism (As We Knew It): A Feminist Critique of Political Economy* (with an updated edition: see Gibson-Graham, 2006). This program is inspired by a broad set of contributions in humanities and social science: anti-essentialist Marxian political economy, post-structural feminism, ecological humanities, and science and technology studies. They notably defend the thesis of “capitalocentrism”, a term they forged to capture the centrality of capitalism in economic representations and its resulting reinforcement: capitalism is represented “as so dominant is that people assume it is insurmountable” (Gibson-Graham & Dombroski, 2020, p.

1). With this neologism, formed by analogy with the phallocratic discourse in which woman is the same, the opposite, or the complement of man, they aim to show that, through the prism of mainstream economic representations and imaginations, “capitalism has no outside” (Gibson-Graham, 2006, p. xxiii). They point out that, in the context of capitalocentrism, “capitalism which is actually a specific economic form becomes the very model or definition of economy. By virtue of their differences from capitalism, all other forms of economy fail to conform to true economic specifications. They underline that capitalocentrism is obviously supported by those who explicitly and deliberately support the visions it carries, but that paradoxically perhaps it is also a trap in which its opponents are caught. It “deadens the imagination of ‘other worlds’ and shuts down politics” (Healy & Gibson-Graham, 2019, p. 1181). Through symbolic and discursive representations, capitalocentrism renders “the capitalist economic system as so dominant [...] that people assume it is insurmountable” (Gibson-Graham & Dombroski, 2020, p. 1).

Accordingly, Gibson-Graham follow the objective of theorising and therefore making visible “existing noncapitalist economic organizations and practices” (Gibson-Graham, 2006, p. xxxiii). They propose, only once that they have “confront[ed] the understandings of capitalism that stood in the way” (2008, p. 614), to “abandon the study of a capitalist system (an ‘-ism’ with essentially immutable laws) and move to the study of capitalist economic practices, as well as other kinds of economic practices” (Gibson-Graham & Dombroski, 2020, p. 6). Attached to the performativity of knowledge, they claim that “research makes some things ‘more real’ by the very act of focusing on certain objects or relations, by developing language with which to identify and distinguish these objects or relations, and by devising discursive framings that situate these objects and relations in hierarchies of meaning” (Gibson-Graham & Dombroski,

2020, p. 8). They, therefore, argue that “other worlds” are possible based on the existing one through ontological reframing, re-reading for difference, and cultivating creativity¹⁹.

I find this approach particularly enlightening for assessing the centrality of natural capital accounting and nature valuation in discourse and knowledge production, which I coin as “valuation-centrism”, in analogy with capitalocentrism. The valuation of nature as a prerequisite for its effective management is so forcefully and obviously posed as a premise for conservation that it is not questioned as such; debates may focus on forms of accounting, classification systems, measurement and valuation methods, but not on the underlying project of “valuing nature to save it”.

This conceptual framework that unveils the centrality of capitalist representations in economic practices is close to Brand and Vadrot’s concept of “epistemic selectivity”, through which they account for the way in which political institutions “privilege particular forms of knowledge, problem perceptions and narratives over others” (2013, p. 207). In her work on expertise in the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES), however, Vadrot (2014) has mainly focused on the discursive framing of biodiversity values in this particular arena. I propose to account for the hegemony and pervasiveness of natural capital accounting that is more than epistemic and that extends far beyond the sphere of environmental expertise.

¹⁹ It is worth noting that the proposition of J.K. Gibson-Graham to identify, study, and theorise the diversity of economic practices, also echoes the proposal of a pluralisation of science. This is through differences that pluralisation of science should work: “empowering and supporting these differences can promote ethical and solidaristic modes of interdependence and help mitigate some of the key challenges of our time” (Gibson-Graham & Dombroski, 2020, p. 1); “it means working with people who are already making new worlds, but it does not mean abandoning the academy to do so. Rather than attempting to bridge an imagined divide between academy and community (by becoming activists in a traditional sense), we can exercise our academic capacities in a performative division of labor that involves many social locations and callings” (Gibson-Graham, 2008, p. 629).

In the second article of my thesis, I will show that valuation-centrism is not only driven by a system of discourse and knowledge but also “staged” through “dramaturgical performances” (Maechler & Boisvert, Forthcoming), a concept that is borrowed from critical management literature studying “organisations as theatre” (Biehl-Missal, 2011) on which I will come back later. This leads to examining not only how stories about natural capital accounting and valuation are told, but also how they are orchestrated, spectacularised, staged, and performed to impress, persuade, and create a community of actors who, despite lack of concrete advancements, remain committed to the project.

This chapter has thus proposed to analyse accounting for nature in the context of the high level of uncertainty underpinning the contemporary global ecological crisis. By distinguishing between epistemic and ontological levels of analysis, I have argued in the first article of this thesis that there are limits in the substitution of risk for uncertainty. In this respect, accounting does not, or cannot, provide an objective representation of the world. Accounting for nature in particular focuses on specific ways to reduce uncertainty embodied in different policy objectives, such as risk mitigation or management. I then proposed to examine three ways of accounting for nature as “accounting worlds”, based on Boltanski and Thévenot’s concept of “common worlds”, embodied in different sets of higher principles about the ecological crisis and the means to remedy it. Finally, the specific case of natural capital accounting, which is closely related to the broader context of nature valuation, was proposed as requiring further conceptual analysis. To this end, I have coined the concept of “valuation-centrism”, from Gibson-Graham’s concept of “capitalocentrism”, to propose an answer to the question of why nature valuation remains so prominent in conservation policy narratives. In the next chapter, I

will present the methodological framework, which will take up the distinction between the three accounting worlds.

4. Methodology

I present here the methodology of my thesis. The latter followed a qualitative, interpretivist and mostly inductive research strategy. I draw on a case study, accounting for nature, which provides both an explanation of its historical developments and its contemporary embodiments. From this case, I developed inductively three sub-cases, which are also the three accounting worlds conceptualised in the previous chapter and analysed in the next one. Data on the three sub-cases have been collected according to four main sources of evidence: participant and direct observations, semi-structured and ethnographic interviews, documentary collection, and, to a lesser extent, social media analysis. These sources were then analysed by means of content analysis, focusing on the political stakes behind calculations, procedures, rules, and standards on the one hand, and the symbols, discourses and narratives underlying the way nature is transformed into these accounting calculations, procedures, rules and standards on the other.

4.1 A critical political economy approach

“Knowledge is not a bucket into which grains of information are dropped in the hope that they somehow coalesce into some kind of explanation of the world. For critical methodologists, knowledge is a process of moving towards an understanding of the world and of the knowledge which structures our perceptions of that world”. (L. Harvey, 1990, p. 3).

This thesis builds on a critical political economy approach that Montgomerie defines as an empirical engagement with “the ‘gaps’, the tensions and inconsistencies in dominant accounts of established categories, models and variables” of capitalism (Montgomerie, 2017a, p. 6). My methodology reflects this ambition to uncover the contradictions between, on the one hand, an apparent consensual discourse that underpins accounting for nature as an overarching policy goal, driven by a set of discourses and framings on environmental issues, and, on the other

hand, the concrete ways in which nature is accounted for by different actors, which underpins the different ways through which capitalism is addressing the global ecological crisis.

Drawing on such critical political economy approach and in line with my research objectives, I followed a research strategy that was qualitative, interpretivist, and mostly inductive (Clift, 2014). My research was conducted and developed inductively in the sense that the categories and concepts used emerged from the process of data collection and were tested reflexively against further empirical and theoretical findings. In other words, I did not try to validate pre-defined theoretical claims, but the latter were “made through a process of discovery, not yet foretold by hypothesis” (Montgomerie, 2017a, p. 3). The three sub-cases presented below emerged with the conceptualisation presented in the previous chapter, in particular, through the concept of “accounting worlds” based on the one of “common worlds” (Boltanski & Thévenot, 1991). However, the research also had a few deductive components, since part of the theoretical framework, i.e., the theorisation of risk and uncertainty, was partly developed before most of the data have been collected. In other words, I started my research with the assumption that accounting for nature – my “case study” – reflects an attempt to make sense of the high level of uncertainty underpinning the global ecological crisis, which led me to conceptualise the limits under which uncertainty can be transformed into risks. However, as reflected in the previous chapter, such a theorisation has again been reworked and adapted in the thesis based on further empirical and theoretical analysis, and the assumption that accounting for nature was an engagement with an uncertain (ecological) future was confirmed and clarified. This thesis is thus largely interpretivist and inductive.

My empirical evidence has been found through human observation, experience, and reflexivity (Leander, 2008). As we shall see, I made sense of accounting for nature mainly through

observations, i.e., by attending events, meetings, and conferences on the topic, which is accepted as “an experience of learning by doing, which shapes the questions that researchers seek to answer” (De Pryck & Rauch, Forthcoming, p. 52). This originality of my thesis also explains why my three sub-cases are so closely linked to my conceptual framework – the two having been developed and refined in parallel. I thus started with a particular case, accounting for nature, which has then, progressively, been broken down into three sub-cases.

4.2 Case study

Case study is an attempt to understand and interpret “a bounded set of events” through the ultimate “descriptive explanations of particular outcomes” (J. S. Levy, 2008, p. 2). It is used when “an empirical inquiry must examine a contemporary phenomenon in its real-life context, especially when the boundaries between the phenomenon and context are not clearly evident” (Yin, 2008, p. 18). The contemporary phenomenon, or event(s), that I study is the development of accounting for nature, i.e., a variety of proposals made by different international actors to bring nature into accounting. As we shall see below, I study accounting for nature in a real-life context, primarily by observing how it is developed, discussed, and debated.

Among the different categories of case study, I am closer to “idiographic”, “inductive”, or “interpretative” case study, in the sense that I started my research in an attempt to “describe, explain, interpret, and/or understand a single case as an end in itself rather than as a vehicle for developing broader theoretical generalizations” (J. S. Levy, 2008, p. 4). Initially, my research strategy reflects “an interest in the case rather than an interest in the formulation of a general theory” (Lijphart, 1971, p. 992). Yet, as the research has evolved and has been empirically and theoretically structured, and the data analysed, I have also considered accounting for nature as part of a much broader story linked to how contemporary capitalism makes sense of the global

ecological crisis. Accounting for nature has implications for the global political economy, which makes it possible not entirely to generalise, but to compare and discuss my findings with other empirical cases and phenomena, and to connect them with broader theoretical arguments on the way capitalism responds to contemporary crises. In this regard, there are also resemblances with “plausibility probe” cases where the “analyst probes the details of a particular case in order to shed light on a broader theoretical argument”. As put forward by Levy (2008, p. 6), plausibility probe cases can indeed be realised by starting from idiographic case studies.

Based on the above, I developed sub-cases for tracing and capturing the “total history” of nature accounting (Eckstein, 1975; J. S. Levy, 2008). The sub-cases discussed below and analysed in the next chapter reflect “concatenations of concrete historical events that produce a specific outcome” (Pavone, 2022, p. 147). Historical events are here related to the development of particular methods for accounting for nature, their theoretical underpinnings, the outcome being groups of actors that discuss those methods in an institutionalised context. Such an analysis of “concatenations of events”, although described as “inductive process-tracing” (George & Bennett, 2005), provides historical explanations through the form of a detailed narrative. It “may reveal potentially causal processes that the researcher had not theorized a priori” (Trampusch & Palier, 2016, p. 442), not only between individual events, but also with wider phenomena.

I developed three sub-cases inductively throughout the research based on a back-and-forth with empirical and theoretical readings, which also explain why the sub-cases reflect the three accounting worlds. Interpretative case studies are indeed “structured by a well-developed conceptual framework that focuses attention on some theoretically specified aspects of reality

and neglects others” (J. S. Levy, 2008, p. 4). Each of the sub-cases can be clearly distinguished, although there are, sometimes, some interactions and interplay between them that I will try to put forward in the next chapter. As proposed in the table below (a more complete version of this table, including elements of analysis, will be presented in the next chapter), the sub-cases are linked to particular historical periods of time. One or two leading organisations often orchestrate their developments and related discussions within an institutional setting. Moreover, the type of governance under which accounting for nature is discussed and developed is also distinct between the sub-cases, although each of the sub-cases involves different and sometimes competing forms of authority, which often makes, with the notable exception of sub-case 1, its governance “multi-level” (Liesbet & Gary, 2003).

Table 1. Sub-cases of accounting for nature (Source: Author)

	Environmental accounting	Natural capital accounting	Financial accounting for nature-related risks
	<u>SUB-CASE 1</u>	<u>SUB-CASE 2</u>	<u>SUB-CASE 3</u>
Date of origin	1990	1990 (revived in 2010)	2015
Main organisation(s)	UNSD	International biodiversity assessments’ organisations Natural Capital Coalition ISO	IFRS Foundation EFRAG (EU)
Type of organisations	United Nations	Business, conservation organisations, private coalitions	Financial standard-setters
Governance	Public / State-led / International	Multistakeholder / Transnational	Private / Transnational / International

4.2.1 Sub-case 1: Environmental accounting

This first sub-case is also referred to as “the first accounting world”, or “environmental accounting”. It is primarily about an instrument conceived, developed and used within the UN context since the early 1990s and elevated to the status of an international standard in 2012: the “System of Integrated Environmental and Economic Accounting” (SEEA)²⁰. Such a system of accounting for nature has given rise to numerous meetings and methodological debates aimed at integrating nature, primarily turned into biophysical indicators, into the systems, rules and principles of public accounting.

This is the only case in which discussions primarily take place between states (or states’ bureaucrats) in a UN context. More precisely, the SEEA involves national and international statisticians meeting in the context of the United Nations Statistics Division (UNSD)²¹ in charge of international statistical standards and most notably of the System of National Account (SNA) used for GDP. UNSD coordinates debates on the SEEA. Discussions also include other international organisations involved in different ways in the global (environmental) statistical system such as Eurostat, the World Bank, UNEP, and the OECD. Actors involved in the SEEA often refer to themselves as “the statistical community”, which, as we shall see in the next chapter, helps to differentiate them from other groups of actors engaged in accounting for nature. I have focused mainly on how the SEEA was discussed in a European context. In the latter, the United Nations Economic Commission for Europe (UNECE) is another important actor²².

²⁰System of Environmental Economic Accounting. “What is the SEEA?”. (2023). <https://seea.un.org/> (accessed April 10, 2023).

²¹ UN Department of Economic and Social Affairs. “Statistics”. (2023). <https://unstats.un.org/UNSDWebsite/> (accessed April 10, 2023).

²² UNECE. “Environmental-Economic Accounting”. (2023). <https://unece.org/statistics/environmental-economic-accounting> (accessed April 10, 2023).

It is worth noting that it is the only sub-case that is not mobilised in any of the three articles of the thesis – or only mentioned *en passant*. This is one of the limits of this thesis, notably related to the way in which I initially made sense of my object. While public environmental accounting is the way in which accounting for nature was originally conceived and developed, since the mid-2000s it has been in relative decline in public debates, supplanted, as we shall see in the analysis, by natural capital accounting. The events organised within the framework of the SEEA are becoming rarer, and/or drawing more and more on the second accounting world (and second sub-case), that of natural capital accounting. For instance, we shall see that from the 2010s, the SEEA has been complemented by another methodology based on the inputs of the second accounting world, aimed at valuing ecosystem services (SEEA-EA)²³. This methodology reflects a kind of “hybrid” between the worlds. As we will see in the next chapter, it has also given rise to much debate and controversy among the statisticians who develop these methodologies.

An in-depth understanding of this accounting world would probably require a historical analysis, based on numerous interviews with experts involved during the early debates of the SEEA in the 1990s, and a document analysis with perhaps some archival work. Perhaps, it could have been a thesis on its own. Here, I examine accounting for nature as a broader and more diverse phenomenon, without focusing only on a specific project. I do, however, provide some historical explanations of the evolution of the SEEA, mainly based on secondary literature and primary documentation, but also on observations, the latter allowing some important controversies to be highlighted.

²³ UN. “Ecosystem Accounting”. (2023). <https://seea.un.org/ecosystem-accounting> (accessed April 14, 2023).

4.2.2 Sub-case 2: Natural capital accounting

This sub-case is also referred to as “the second accounting world”, or natural capital accounting. It is also the case for which I have collected the most data, which is not unrelated to the fact that it is the most active sub-case in terms of events organisation, and the one that is composed of the greatest variety of actors. For many years, i.e., almost from the beginning and largely still today, the promise of a capitalist response to the global ecological crisis by accounting for nature has been conveyed through natural capital accounting. Furthermore, it should be noted that my thesis was initially developed, at the time of my research proposal, solely according to this sub-case of natural capital accounting. It was only later in my research process that I extended my focus to other ways of accounting for nature.

I already knew, before starting my thesis, thanks to a previous position in an NGO based in Geneva and involved in raising environmental awareness through the monetary valuation of nature, that one organisation was central to natural capital accounting, setting most of its standards and organising many dedicated meetings – some of them that I had already followed. This is the Natural Capital Coalition²⁴: a multistakeholder initiative of currently 311 members set up in 2014 by WBCSD and IUCN – both based in the Geneva region²⁵ – and which cooperates closely with the European Commission²⁶. It proposes primarily to bring nature, turned into monetary values, into private accounting, although its ambition, as we shall see in the next chapter, goes well beyond this instrument.

²⁴ In 2019, the Natural Capital Coalition merged with another organisation, the Social & Human Capital Coalition, to create the Capitals Coalition. However, I will keep its past denomination, also because some “insiders” continue to use it.

²⁵ IUCN. “IUCN Conservation Centre”. (2023). <https://www.iucn.org/about-iucn/iucn-conservation-centre> (accessed April 8, 2023); WBCSD. “How to find us”. (2023). <https://www.wbcd.org/Overview/About-us/How-to-find-us> (accessed April 8, 2023).

²⁶ Capitals Coalition. “The Coalition”. (2023). <https://capitalscoalition.org/the-coalition/> (accessed April 12, 2023).

This case includes firstly actors that are members of, working for, or participating in the activities of the Natural Capital Coalition, including international environmental organisations, businesses – including many consultancies –, and other multistakeholder coalitions. Together, they often call themselves “the natural capital community”, although the boundaries and rules, be they implicit, to be part of this community are not always clear. A whole section is dedicated to the presentation of this organisation in the next chapter, and further details will also be provided in the description of my observations. What should be kept in mind at this stage is that this organisation reflects a hybrid form of governance and authority (Graz, 2006), organised under the model of a “multistakeholder partnership” (Bäckstrand, 2006).

Secondly, natural capital accounting has been developed in close proximity to the international field of biodiversity expertise, which, unlike climate expertise with the IPCC being “the voice of climate change” (De Pryck, 2022), is not clearly homogenous – although this is increasingly the case with the growing authority of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)²⁷. While the emergence of the Natural Capital Coalition – and, more generally, of natural capital accounting – has been shaped by the international field of biodiversity expertise, I will show that the latter has also become one of the spheres of influence of the former. I have thus focused on the key institutional moments of biodiversity expertise to examine how they relate to natural capital accounting. I have examined several reports written from the early 1990s by the environmental economists David Pearce for a variety of international organisations; the 2005 *Millennium Ecosystem Assessment* (MEA), which is a global assessment of biodiversity launched in 2000 by the then UN Secretary General Kofi Annan; an initiative called *The Economics of Ecosystems and Biodiversity* (TEEB) decided

²⁷ IPBES. “About”. (2023). <https://www.ipbes.net/about> (accessed April 14, 2023).

at the Potsdam G8(+5) environmental ministers' meeting in 2007, with the prospect of studying the “economic significance of the global loss of biological diversity”; a report published by the UK Treasury in 2021 called *The Economics of Biodiversity: The Dasgupta Review*; and, finally, the work of the IPBES created in 2012 for providing global assessments of biodiversity and ecosystems, particularly with regard to nature values and valuation.

These are not only reports but important institutional moments during which diverse actors – not only scientific experts but also a vast range of “biodiversity professionals” – worked together for assessing the global values of nature. We shall see that those reports sometimes gave rise to new institutions or institutional configurations. Moreover, these fields of expertise and the reports associated with them, especially the most recent ones, also gave rise to several meetings and conferences dedicated to their wider dissemination, some of which, as will be discussed below, I have attended.

Closely related to this sub-case is another transnational organisation which, in the course of my thesis, was involved in standard setting for natural capital accounting: the International Organization for Standardization (ISO). ISO is not formally an international organisation. This a private (or transnational) organisation, registered in Switzerland, Geneva, and composed of the most representative national standardisation organisations – 167 at the time of writing²⁸. However, my unit of analysis is not ISO itself, but the technical committee and working groups developing the standards (ISO/TC 207/SC 1/WG 8 & 7)²⁹. It involves private actors who took part in the standardisation process for professional and/or personal reasons. These people are in

²⁸ ISO. “Members”. (2023). <https://www.iso.org/members.html> (accessed April 13, 2023).

²⁹ ISO. “ISO/TC 207/SC 1 Environmental management systems”. (2023). <https://www.iso.org/committee/54818.html> (accessed April 10, 2023).

charge of their own consulting firms, employees of big firms or of national standardisation organisations, or scholars.

I sought to understand here how natural capital accounting was discussed and developed by an organisation historically well-established in the field of environmental standardisation (Clapp, 1998). I have explored two standards developed by ISO – *ISO 14007 on environmental costs and benefits analyses*³⁰, and *ISO 14008 on monetary valuation of environmental impacts and aspects*³¹. While these standards are not directly standardising natural capital accounting as such, they are, however, integral components of it since they help provide monetary values of the environment.

4.2.3 Sub-case 3: Accounting for nature-related risks

This sub-case reflects the “third accounting world”, or accounting for nature-related risks. It focuses on how private financial accounting standard-setters are including environmental issues within their mandate, and thus within, or close to, financial accounting standards. I was lucky that in the middle of my thesis, those central actors of accounting, but also of global financial capitalism (Leblond, 2011; Mügge & Stellinga, 2015; Perry & Nölke, 2006), made this move in early 2020, following a broader trend in finance started in 2015, particularly in the context of the COP 21 climate conference in Paris, as will be described in the next chapter. This sub-case has thus been the latest to be included in my research – although I was already exploring how financial accounting was dealing with environmental issues. The standards I have explored

³⁰ ISO. “ISO 14007:2019. Environmental management — Guidelines for determining environmental costs and benefits”. (2023). <https://www.iso.org/standard/70139.html> (accessed April 15, 2023).

³¹ ISO. “ISO 14008:2019. Monetary valuation of environmental impacts and related environmental aspects”. (2023). <https://www.iso.org/standard/43243.html> (accessed April 15, 2023).

are still in the process of being developed, although it is already known what their broad guidelines are.

I have focused on two separate accounting projects developed almost at the same time and at the same pace by two financial accounting authorities, both of which involve what I call “accounting for nature-related risks”, although the terminology traditionally used by those actors is “sustainability reporting”. The first is devised by the IFRS Foundation. It is a private, not-for-profit organisation, based in London³², and only recently also in Frankfurt³³ and Montreal³⁴ in relation to the new sustainability standards, developed by a new International Sustainability Standards Board (ISSB). The IFRS Foundation already governs “traditional” financial accounting standards almost globally since the early 2000s. Members of the IFRS Foundation and of the group developing the traditional financial reporting standards within the International Accounting Standards Board (IASB), and the sustainability reporting ones within the ISSB, are designated in their personal capacity and in relation to their expertise in accounting standards and governance, and according to a geographical repartition³⁵. They often come from national financial regulatory authorities on the one hand, or from one of the Big Four accounting, audit, and consulting firms on the other³⁶. For sustainability reporting, the

³² IFRS Foundation. “The IFRS Foundation has moved”. (August 6, 2018). <https://www.ifrs.org/news-and-events/news/2018/08/the-ifrs-foundation-has-moved/> (accessed April 14, 2023).

³³ IFRS Foundation. “IFRS Foundation agrees Memoranda of Understanding to establish ISSB presence in Frankfurt, marking first step towards a global footprint”. (March 2, 2023). <https://www.ifrs.org/news-and-events/news/2022/03/ifrs-foundation-agrees-mous-to-establish-issb-presence-in-frankfurt/> (accessed April 14, 2023).

³⁴ IFRS Foundation. “IFRS Foundation launches Montreal ISSB centre supported by key actions” (June 28, 2022). <https://www.ifrs.org/news-and-events/news/2022/06/ifrs-foundation-launches-montreal-issb-centre-supported-by-key-actions/> (accessed April 14, 2023).

³⁵ IFRS Foundation. “Process for IASB member appointments”. (2023). <https://www.ifrs.org/groups/international-accounting-standards-board/board-member-appointments-/> (accessed April 14, 2023).

³⁶ EY, KPMG, PwC, Deloitte.

standard-setting group is also composed of new types of experts with prior experience in assessing financial sustainability (e.g., sustainability rating agencies)³⁷.

The second project has been engaged by the European Commission and is being developed by the European Financial Reporting Advisory Group (EFRAG). EFRAG is a body of experts set up in 2001 primarily to bring technical advice to the European Commission on financial accounting standards (i.e., the IFRS standards)³⁸. When it comes to accounting for nature, the EU decided not to follow the IFRS Foundation and to develop its own project, which yet draws on the same principles and categories, and treats “nature” in quite the same way – despite some differences and controversies that I will raise in particular in the third article of my thesis. The EFRAG expert group is setting standards for the EU “Corporate Sustainability Reporting Directive” (CSRD)³⁹. This group is composed of a variety of actors coming from public and private financial institutions, universities, trade unions, NGOs, non-financial reporting initiatives, business firms, all selected on the basis of a public call and according to the category to which they belong, and to a geographical representation of the EU member countries⁴⁰.

To sum up, my sub-cases reflect a diversity of actors and initiatives reflecting historical sequences of accounting for nature that continue to exist today. These sub-cases echo the three

³⁷ IFRS Foundation. “International Sustainability Standards Board. Members”. (2023). <https://www.ifrs.org/groups/international-sustainability-standards-board/#members> (accessed April 14, 2023).

³⁸ EFRAG. “About us. Efrag facts”. (2023). <https://www.efrag.org/About/Facts> (accessed April 14, 2023).

³⁹ European Commission. “Finance. Corporate sustainability reporting”. (2023). https://finance.ec.europa.eu/capital-markets-union-and-financial-markets/company-reporting-and-auditing/company-reporting/corporate-sustainability-reporting_en (accessed April 14, 2023).

⁴⁰ EFRAG. “Appointed – Members and Chair of the European Lab Project Task Force on preparatory work for the elaboration of possible EU non-financial reporting standards”. (April 9, 2020). <https://www.efrag.org/News/Project-434/Appointed--Members-and-Chair-of-the-European-Lab-Project-Task-Force-on-preparatory-work-for-the-elaboration-of-possible-EU-non-financial-reporting-standards-> (accessed April 14, 2023).

accounting worlds conceptualised in the former chapter and analysed in this order in the next chapter dedicated to the analysis and findings.

4.3 Data collection and source material

The thesis is based on fieldwork undertaken all along the thesis, more particularly from October 2018 until March 2023⁴¹. The material collected on which the substantive arguments are based falls into three (or four) main categories: participant and direct observations, semi-structured and ethnographic interviews, documentary analysis, and, to a lesser extent, social media analysis⁴².

4.3.1 Observations

Observations – both direct and participant – are my primary source of data on which I developed and refined my argument over the years of the thesis. I have drawn partly on participant observations for sub-case 2, in relation to natural capital accounting. For the other sub-cases, I have drawn on direct observations only. Direct observation means that although I had some interactions with other participants, I was not involved, or exposed, to “the day-to-day or routine activities of participants” (Schensul, Schensul, & LeCompte, 1999, p. 91). In contrast, I think I was fortunate to be able to say that this was the case with regard to my involvement in two of the three natural capital accounting sites (in the context of some of the activities of the Natural Capital Coalition, and within ISO), to the extent that I may have become an “insider” (Kawulich, 2005). During those participant observations, I may have sometimes influenced the policy process that I was studying by performing some (even basic) tasks (De Pryck & Rauch,

⁴¹ I continued to follow some meetings after the private defence, two of which provided interesting information and have therefore been included here.

⁴² I thus mobilise four of the six common sources of evidence in doing case studies: direct observations, participant observations, semi-structured interviews, and documents. The two other sources of evidence being physical artifacts, and archival records (Yin, 2012).

Forthcoming). I will come back in more detail on those tasks in the description of my participant observations.

For the three sub-cases, many events have been followed online. While for some events, specifically in relation to sub-case 3, it was due to the Covid-19 pandemic, which has prompted a number of scholars to engage in this type of “digital observations” and which has probably given me the opportunity to follow the ongoing debates more closely than if they had taken place in person, i.e., for practical reasons of budget and travel (Albaret, 2022), a number of other events were purposely thought of in this format, even before the pandemic. For some online events, the aim was only to provide the audience with a piece of technical knowledge. For other online events, especially linked to sub-case 2 and the Natural Capital Coalition, the aim was different in the sense that they can almost be studied as in-person events. Events, or meetings, aim at providing the audience with an “experience” – a point that will be further discussed in the next chapter. Online events and meetings are sometimes carefully orchestrated and try to reproduce the atmosphere and interactions of in-person events, although they do not always succeed. At some events organised by the Natural Capital Coalition, participants are urged to get involved and perform tasks that shape the course of the event. In this sense, it is possible to speak of “digital participant observation”, especially when these meetings are recurrent.

For both observations and participant observations, online and in-person, I took as many notes as possible, whether on my laptop or on my phone. I also took pictures, including some screenshots when it was online, to remember the “atmosphere” of those events and sometimes just to remember who was there. I revised my notes the following days of the meeting, or,

sometimes, directly after the meeting⁴³. In total, I observed and/or participated in fifty-three events ranging from one hour to several days, and from October 2018 to March 2023 (see Appendix 1). Below, I give more details on each of the different sites of observation according to the three sub-cases and explain how I got involved in each of them.

Box 1. Referencing observations

In the next chapter dedicated to the analysis, I refer to the observations as follows:

O = Observation

#1 = Number of the observation, classified in chronological order

-1 = Sub-case (here n°1)

-D *or* -P = Direct or Participant observation

For instance:

O#45-3-D = direct observation n°45 dedicated to sub-case 3

4.3.1.1 Observations in public environmental accounting (sub-case 1)

Observations in public environmental accounting are all closely related to the SEEA methodology developed and used in a UN context. As already mentioned, meetings are less numerous than for other sub-cases, but they still happen on a regular, institutional basis. I have followed two events jointly organised by the United Nations Economic Commission for Europe (UNECE) and the Organisation for Economic Co-operation and Development (OECD) aimed first at reviewing how European countries are applying the SEEA methodology, particularly how they collect and record their statistical environmental data. Those meetings were also composed of presentations to reflect on the future of the methodology, such as “accounting for a circular economy”.

⁴³ An extract from my observation notes can be found in Appendix 5 (European Business and Nature Summit 2022, Brussels).

While one of the meetings took place online due to the Covid-19 pandemic, the other was at the United Nations site in Geneva. It was easy to register through the UN platform – as an academic observer, an existing category on the UN website. The audience (and speakers), about a hundred people, were all experts from national or international administrations and organisations, primarily statisticians (I was the only academic observer). These two meetings were very formal, in that the participants were directly representing their organisation or country. The language used was also much more technical and difficult to follow for a non-expert. During this meeting at the UN, someone made an announcement about another meeting happening in the context of a “voluntarily informal group”, in which “people do not have a mandate (...) people can just come in and be a silent partner” (O#8-1-D). This person was referring to the London Group on Environmental Accounting.

This latter meeting that I then followed was not about the application of the methodology, but its further developments, a task fulfilled by this London Group on Environmental Accounting, initially set as an informal group in 1993 to allow statistical “practitioners to share their experience of developing and implementing environmental accounts linked to the System of National Accounts”⁴⁴. The registration was indeed not a formal procedure as for other UN meetings (see below). As I did not find out how to participate, I sent an email to the “convenor” of the London Group⁴⁵, a German national statistician, introducing myself by describing my research and my desire to observe the ongoing debates in the environmental accounting field. He did not really understand the status of an observer, but he agreed to let me participate as any other participant and put me on a mailing list, which gave me access to all the information

⁴⁴ System of Environmental Economic Accounting. “London Group on Environmental Accounting”. (2023). <https://seea.un.org/content/london-group-environmental-accounting> (accessed April 10, 2023).

⁴⁵ I found his name on the website of the organisation: *ibid*.

needed to register via a form. While the four-day meeting was initially planned in Bonn, Germany, it finally took place online due to the Covid-19 pandemic. This meeting, and other exchanges between this community of statisticians (approximately thirty people), were particularly interesting in view of the issues that they raised in relation to monetary valuation, which they were (strongly) opposed to – a point that will be further discussed in the analysis.

The informal character of this the London Group on Environmental Accounting was directly put forward at beginning of this five-days meeting, with one of the organisers clearly asking the participants to speak freely, explaining, orally at the beginning of the meeting and then in the chat, that “we decided not to record because the London Group is more a think tank than a working group and you should be able to speak openly and freely as expert and not for your organisation” (O#21-1-D)⁴⁶. As we shall see in the next chapter, speaking freely often means having the possibility to deviate from the official position of its own organisation (meaning country, as they usually are national statisticians). As described below in Box 2, this informality has been favoured by the fact that the meeting was taking place online, and not in-person.

Box 2. (In)formality of discussions in the London Group of Environmental Accounting

This group of people was not really familiar with online meetings and the different tools they provide. They would sometimes send a message to the whole discussion group while thinking (I suppose) that they were sending their message to someone in particular, which was interesting because (I suppose again) they wouldn't have said that in public. In other words, I had access to some forms of private or internal discussions. In general, it was interesting to see that even if the formal, or oral, discussions had moved on to another point, the chat between some people (but visible to all, purposely, or not) was still about an earlier point that had raised tensions. If the meeting had taken place in person, it is as if people had continued to whisper to each other about the previous point. Here, those whispers were made visible (or “hearable”), without disrupting the official conversation. Some elements of this are mentioned in the next chapter, but anonymised so that we cannot know who is speaking.

⁴⁶ It contrasted starkly with the abovementioned meeting at the UN, for which precise minutes were being taken and then published on the UN website.

During these observations, I focused primarily on the content of the discussions, on who was speaking about what, responding to what and to whom. As we shall see, in addition to this research strategy, I have also focused more on the role of symbols when it comes to observations in sub-case 2, as they play a more essential role than in this sub-case 1.

4.3.1.2 Observations in natural capital accounting (sub-case 2)

Here I distinguish my observations according to three related sites dealing in different ways with natural capital accounting. They are all concerned with natural capital accounting, but distinct in that they do not (always) involve the same people and organisations, and do not always approach natural capital accounting in the same way. I focus first on direct and participant observations in the context of the Natural Capital Coalition's activities. I then focus on direct observations related to the publication of international reports on biodiversity. Finally, I present my participant observations in the context of the ISO standard-setting process.

4.3.1.2.1 Observations related to the Natural Capital Coalition's activities

Many events related to natural capital accounting were already taking place online before the pandemic hit. Once a month, usually, an online meeting is organised under the direct or indirect patronage of the Natural Capital Coalition. As I will detail, the main objective of those involved in natural capital accounting is to keep the promise it vehiculates high in the policy agenda, and to diffuse it as globally as possible – sometimes two online sessions on the same topic are organised on the same day to allow participants from different time zones to get involved.

Before starting my thesis, I was already following the Twitter account of the Natural Capital Coalition and its associated organisations and was also already registered to different email

newsletters informing about the Natural Capital Coalition’s activities. This is how I got access to their meetings, i.e., simply by registering at their events. I have followed many of these online events all along the thesis usually organised via Webex or Zoom. These meetings include from 10 to (exceptionally) 300 participants. Wherever possible, i.e., when the number of participants is not too high, each (new) participant is proposed to introduce him/herself. When they stopped asking me to do so, I realised that I was now part of the landscape – viewed as a regular participant. I was simply presenting myself as a political economist working on natural capital accounting. I think that many people kept thinking that I was an economist, rather than a *political* economist, which may have facilitated my integration. I did not use the term “political scientist” on purpose, as I already had the experience in the past that it may fear my interlocutors. I remained mostly silent during online events, as did most of the participants, despite the stated intention to encourage informal interactions. Interactions essentially take place through pools and through the chat, most often during the dedicated “Q&A” period, when they urge people to participate by asking questions. Sometimes I asked questions. But as I wanted to be considered as part of the group, these questions were not directly related to my research, but to the event that had just taken place, trying to use the terms and vocabulary used by the others (e.g., “How can we mainstream to use of natural capital accounting in the apparel sector”). Activities organised by the Natural Capital Coalition thus lend themselves very well to participant observations. One of their characteristics is that they are (almost) always open to anyone who wants to get involved and that they often encourage people to get involved.

These online meetings last between one and two hours. Their organisation is orchestrated by a “convenor” either officially representing the Natural Capital Coalition, or an associated organisation (such as IUCN, WBCSD, UNEP, the World Bank), or other partner coalitions (such as “We Value Nature”, “Aligning accounting approaches for nature”, or “Business for

Nature”). He or she has the tasks of keeping time and introducing new speakers. After the usual presentation of the Natural Capital Coalition’s goals and missions (and/or of the associated organisation or coalition) and the summary of the last meeting, the convenor usually presents the topic of the day. The topic may be natural capital accounting for a specific sector (e.g., the raw material industry, the food industry, the apparel industry, three of the most targeted ones), related to the publication of one of the many standards or reports published by the Coalition and its affiliated organisations. The floor is then given to one or two experts who present, for a few minutes, the theme of the day, or the technical aspects of the new standard or report – these are usually the ones who, with others, drafted the standard or report. They can be environmental economists working for international organisations such as UNEP or the World Bank, or consultants in sustainability. They can also be scholars, often from a prestigious (most often British) institution (Oxford, or Cambridge, whose Institute for Sustainability Leadership is an important member and recurrent participant of the Natural Capital Coalition’s activities). After that, a sustainability manager and/or a consultant presents a “case study”, which helps for instance understand how the standard can be practically used by organisations (most often by business firms). Then comes the time for questions, often oriented to “practice”. Answers are always hypothetical, in the sense that they imagine what natural capital accounting would do if it was already implemented as proposed by such or such standard. The meeting closes with a reminder to become a member of the Natural Capital Coalition for those who are not yet (although not being a member does not preclude participation in the activities), the importance to subscribe to the newsletter(s), and the announcement of the topic of the next meeting. These online meetings constitute the “day-to-day” (or “month-to-month”) manifestation of natural capital accounting. The specific role of online meetings within the Natural Capital Coalition is further explained below (Box 3).

Box 3. The role of meetings within the Natural Capital Coalition

At first, I followed every meeting of the Natural Capital Coalition with the fear of missing an important development. Such important development, although always promised, has never happened. As the meetings went on, I took fewer and fewer notes, as the same things were said over and over again, or reworded in slightly different ways. It took me a while to really understand that the technical aspects and concrete developments were secondary, and what mattered most was to be active at all costs. As I will explain later, these events, even if they are only attended by a few people, allow the Natural Capital Coalition to make its presence felt. The events are always publicised on social networks, Twitter in particular. At the end of the year, or at the end of each project, the Natural Capital Coalition can boast of having organised so many events. All this helps to give natural capital accounting a tangible dimension.

There are also large summits, or, more precisely, the main summit of the year. This event, the European Business & Nature Summit (EBNS, always with a sub-title that emphasises the theme of the year), is organised annually since 2014 – the year the Natural Capital Coalition was founded. It is taking place in person, always in a big European city (although three times in Brussels, which is probably related to the fact that the European Commission is often among the main organisers). It usually takes place during the European “natural capital week”. I participated for the first time in this meeting in 2019, in Madrid. As explained in Box 4 below, my registration was challenging. Then for two years, during the Covid-19 pandemic, the event was taking place online and was open to everyone. They tried to reproduce the atmosphere of the in-person meeting, with many focus groups and interaction moments. They also organised an additional “big” online meeting during the Covid period: the “We Value Nature 10-day challenge”. I went back to the event in-person event in 2022 in Brussels.

Box 4. Registration for EBNS 2019

In 2019, my participation was initially refused (I was not yet the recurring participant I have become). A few days after my registration, which I thought was successful, I received an email informing me that priority was given to business and financial organisations, and, therefore, that was not on the list. It was a real shame as I had already booked my plane tickets and hotel. I explained my situation to the local organiser (a Spanish environmental consulting firm), emphasising my great impatience to take part in this event. I also explained my research, reformulating my research question into their own framing and vocabulary, namely “how natural capital accounting can deliver effective environmental outcomes in the EU”. A few days later, I received an email from the local organiser, he or she is explaining that the “organising team and have agreed to make an exception”.

This event, EBNS, is a compendium of all the new ideas and “formulas” devised during the year in relation to natural capital accounting, which are intensively distilled here over two or three days to an audience of around 300 people. Besides the main events taking place on a stage, there are also smaller meetings sometimes taking place at the same time as the main event. They allow the participants to have a “practical experience” related to natural capital accounting, to engage in a conversation, and to start to know each other. I also looked at who was talking to whom (we all had badges, and after the many online events, I started to know familiar faces). In contrast to online events, this is primarily a meeting place. This is always organised in a venue that allows such kinds of interactions between people. The meeting includes long coffee breaks, lunches, aperitifs, and other side events specifically dedicated to networking. I also looked at the reaction of the audience during presentations, which was mostly the same, if not “expected” or “planned”.

At EBNS 2019, I was still looking for technical advances in the methodologies presented, focusing, as for sub-case 1, primarily on the content of the discussions, on who was speaking about what, responding to what and to whom (see Box 3). But seeing the focus on form rather than content was probably a trigger. I started looking at the wording of the messages rather than

their content. Maybe more than for the other sites of observation, I was inspired by “event ethnography”, as proposed by scholarships studying the orchestration of environmental summits and negotiations (Aykut et al., 2022; Campbell, Corson, Gray, MacDonald, & Brosius, 2014; Death, 2011; Fischer & Gottweis, 2012; Fletcher, 2014), and then, at my second EBNS in 2022, particularly by Biehl-Missal’s analysis of business annual general meetings. She indeed distinguishes between the “performance text”, defined as the “perception occurring through atmospheric, bodily sensations which are influenced by the interplay of aesthetic elements, by the whole behavioral, temporal, and spatial situation”, from the “linguistic text”, which is the verbal message formally delivered (Biehl-Missal, 2011, p. 622). She thus emphasises that the events she has studied constitute an “intricate theatrical moment of sound, text, movement, and colors, shared with and co-created by spectators” (ibid). I was thus paying particular attention to both what was said and not said, to the staging, orchestration, and theatricality of those events and activities, including, by looking at their spatiality and how they favoured, for instance, interactions between people (McConnell, Forthcoming).

4.3.1.2.2 Observations in biodiversity expertise

In the sphere of biodiversity expertise, I primarily observed the communication of new reports. I for instance took part in the annual meeting of the French assessment of ecosystems and ecosystem services (EFESE), which is the national French body of expertise for biodiversity and ecosystems founded in 2012⁴⁷. Thanks to my co-supervisor Valérie Boisvert who recommended this event, for which registration was online, I followed the 2018 meeting in Paris, in *La Défense* district. At this event, which can be considered as a kind of “preliminary

⁴⁷ Ministère de la Transition écologique. “L’évaluation française des écosystèmes et des services écosystémiques”. (2023). <https://www.ecologie.gouv.fr/evaluation-francaise-des-ecosystemes-et-des-services-ecosystemiques> (accessed April 10, 2023).

observation”, I focused mainly on the content of the message in order to acquire the basic technical knowledge of natural capital accounting as developed by this group of experts.

Other events have then been followed online, for instance on the YouTube channel of the organisations. I followed IPBES presentations of new reports, or the release of the 2021 Dasgupta Review, which will both be presented and analysed in the next chapter. In the same way as for the activities of the Natural Capital Coalition, I was both interested in the content of these reports *and* in the way they were communicated to a broader audience than just experts. I had read the reports before following their communication and looked at what was emphasised, or what, in contrast, was lost in such communication. I also looked at who was speaking among the experts involved in the reports, and how questions of the audience were addressed. In other words, I was not only examining how expertise and broad consensus on it were communicated through reports (De Pryck, 2021), but also how such expertise and consensus were communicated through verbal and non-verbal communications (Biehl-Missal, 2011).

4.3.1.2.3 Observations in ISO

“[R]esearchers often do not choose the fieldwork, but the fieldwork chooses them” (De Pryck & Rauch, Forthcoming, p. 51). This describes well my participant observations within ISO. The way I had the opportunity to participate in this ISO standard-setting process, which is not usually open to the public, is to some degree a matter of luck. I found out in 2018 that ISO was setting two standards closely related to natural capital accounting. While the standardisation of ISO 14008 for monetary valuation was already almost achieved, this was not the case with its “twin standard” (experts called it this), ISO 14007⁴⁸. I did three interviews with experts

⁴⁸ Both standards involved almost the same experts.

involved in the standard-setting process. One of them was Swiss. We met close to Aarau, in Switzerland, and this interview lasted almost three hours, deviating a lot from my questions. This Swiss man at the head of a consulting business in sustainability management was also the “convenor” of the ISO 14007 standard-setting process (i.e., the coordinator). He agreed to invite me to the standardisation process. I was registered under the name of his own consulting business, itself member of the Swiss Association for Standardization (SNV). It is indeed mandatory to be part of a national standardisation organisation to participate, the membership involves a high fee, and the University of Lausanne was not part of it.

This is how I embarked on the standardisation process for ISO 14007, which led me to a five-day meeting in Beirut, Lebanon, and offered me “a unique insider’s view on global politics in the making” (Kimber & Maertens, Forthcoming, p. 62). ISO is not only a “black box” in relation to the standards, which in themselves are highly technical and not easily accessible to non-specialists. It is also a “black box” in terms of how it operates, adding to that its set of technical jargon, acronyms, abbreviations, etc. The cost of entry into ISO is certainly high compared to other organisations (e.g., it is very different from the Natural Capital Coalition, which has no formal rules, including for the setting of standards, and is easy to access, with limited technical jargon). In this context, I benefited greatly from numerous exchanges with Jean-Christophe Graz and Christophe Hauert. Both of them had extensive knowledge of this organisation due to a past research-action project aimed at supporting and promoting the involvement of civil society actors in the development of international standards, during which they participated in ISO standard-setting processes – the INTERNORM project (Graz & Hauert, 2019; Hauert, Audétat, Bütschi, Kaufmann, & Graz, 2016). As a result of these discussions and a lot of

readings, especially by the aforementioned scholars and of the ISO documents and website⁴⁹, I have arrived at a somewhat less confused state of affairs in the standard development process.

During the five-day meeting, I was almost considered a normal participant in the standard-setting process. I spoke out on some few points on which I thought I had the expertise (see Box 6), and some participating experts, in the end, even asked for my opinion (all of them knew my special, yet not really defined status, as I was officially a participant). The meeting took place in the Movenpick hotel in Beirut, in March 2019. It involved (only) eleven people in person, only from Western countries (see Box 5). Some other people made some online apparitions at some points of the discussion. The negotiations on the standard were already well-advanced, and the debates were mostly about technical issues. However, an interesting point was the fear that the vocabulary used in the standard is not simple enough for users. On this point, the comparison with the discourse and framing of natural capital accounting was explicit.

Box 5. ISO 14007 standard-setting process

It was interesting to note, for example, that the ISO 14007 standard was ultimately achieved almost entirely by three people who seemed to know the functioning of ISO better than the others, but not the object of the standard as such (here, environmental cost and benefit analysis). These three people sometimes even met in the evening, after the official meeting, to take up some of the points that had been debated during the day, in order to solve the problem without raising a new debate the next day. In the end, I was very surprised to see how informal it was; how internationally recognised standards such as ISO ones were made by only a few people who for some, also had a very personal interest in them since their own consulting business would then be involved in their application.

⁴⁹ See, for instance, the glossary of terms of ISO: ISO. “Glossary”. (2023). <https://www.iso.org/glossary.html> (accessed April 15, 2023); or its use of terminologies: ISO, “Terminology (principles and coordination) Including terminography”. (2023). <https://www.iso.org/ics/01.020/x/> (accessed April 15, 2023)

Just as for sub-case 1, I have focused primarily on the content of the discussions, on who was speaking about what, responding to what and to whom, as well as who was taking the floor and leading the discussions. I have for instance observed that to be heard, it was more important to have knowledge of ISO's technical jargon, rather than true expertise of the subject of the standardisation process (see Box. 5 above). I have examined not only the standard-setting process itself but also how these experts conceived their standards within the broader landscape of standards and initiatives for natural capital accounting. As will be detailed in the fifth chapter, the fact that nobody closely or remotely related to the Natural Capital Coalition participated in the setting of the standards, and that the standards did not really engage with the metrics, methods, but also discourse and framing of the Natural Capital Coalition, has been central to my analysis of this standard-setting process, and to the standards themselves. Detailed findings on this ISO standard-setting process have also been published in a book chapter, entitled *The Standardization of Natural Capital Accounting* (Maechler & Graz, 2020). This chapter is not included in the thesis because it focuses very much on the standards themselves, on the process of standardisation within ISO, and not so much on how they fit into the wider process or phenomenon of accounting for nature, including natural capital accounting and its political dynamics.

Box 6. My role in ISO 14007 standard-setting process

I tried as much as possible not to influence the process while justifying my presence. For example, I did relatively “basic” tasks, such as creating the bibliography of the standard. Yet, I realised that this task is also of great importance, as the bibliography is not only about what is cited in the standard but also about “going further”. It is therefore also possible to include other sources from other, sometimes competing, organisations. I knew, for example, that I had to include the Natural Capital Protocol drafted by the Natural Capital Coalition, although everyone knew that it was not properly a standard (I will come back on this point in the analysis). More generally, I sometimes indicated that some of the terms used in the standard did not seem “scientific” to me; but was told each time that this was the language used by ISO, which ended the debate. I was also asked to make a presentation of the various initiatives

underway, which I had prepared. However, due to a lack of time, this presentation did not take place. Finally, the convenor of the standardisation process asked me if it would be possible to organise an event on the standard at the University of Lausanne. He probably hoped that I would make a gesture in return for his invitation and the great opportunity he offered me. I told him that I would see what I could do, but as time went by, he did not come back to me. I was quite positive about this, as it seemed to me that the convenor wanted to use such an event primarily to promote his consulting business, rather than the standard itself.

Finally, I also participated in three other online meetings after the one in Beirut to finalise the details of the standard. These last meetings were aimed at discussing the points that did not find any agreement during the in-person meeting. As few people participated in these online meetings and these points of disagreement were quickly resolved⁵⁰.

4.3.1.3 Observations in accounting for nature-related risks (sub-case 3)

I started to examine how sites of private financial accounting standardisation were dealing with environmental issues by going to a conference on the topic. This was the annual meeting of the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR) in 2019. Organised by the United Nations Conference on Trade and Development (UNCTAD), this meeting has since the early 2000s specific sessions dedicated to “non-financial accounting and reporting”, which includes environmental issues (in addition to social ones). It also involves presentations from members of financial accounting standard-setting bodies who discuss how such non-financial information can be linked to the financial one. The meeting was taking place at the UN in Geneva – the registration was easy, similar to the abovementioned UN meeting for the implementation of public environmental accounts. This conference gave me a good overview of the existing regulatory landscape on the issue, and

⁵⁰ In the Appendix listing all the events, I do not mention these last ISO meetings, which I consider as part of my observations within ISO in Beirut.

how financial accounting standards were already claiming to address environmental issues, most notably through “non-financial reporting standards”⁵¹. During this conference, I focused mostly on the technical aspects of the discussions, but also on who was there and who was speaking, and on the reaction of the audience. As we shall see, it was interesting to note the presence of people closely associated with the Natural Capital Coalition (sub-case 2), but whose speech on the importance of natural capital accounting has not really been taken seriously by financial accounting experts. At that time, I did not really understand why these two “worlds” (I started to think about them in these terms) seemed so distinct. A few months later, I realised that there was a clear difference in the way these different actors viewed the role and design of accounting for nature, especially when financial accounting standard-setters decided to include environmental issues in their mandate and to create “sustainability reporting standards”.

From 2020 to 2022, I followed the early developments of these sustainability reporting standards by the IFRS Foundation and EFRAG during different public meetings, subscribing to their mailing list beforehand and then registering for the event. Unfortunately, no in-person observation was feasible. It was also perhaps the first time in my research that I felt I was following very high-level political discussions. In contrast to natural capital accounting especially, participants were taking the discussions on the standards very seriously, my impression was that the stakes were considered as high, or at least framed as such. I primarily took part in meetings following a consultation, or events presenting the project of the standards and the latest advancements in this regard. These meetings were primarily meant to present the standards and the vision that underpins them. These were recorded, orchestrated, and planned meetings, with no (or very limited) interaction with the audience – although the EU consultation

⁵¹ This terminology was used before financial accounting standard-setters (e.g., IFRS Foundation and EFRAG) started to include environmental issues in their mandate and referred to this as “sustainability reporting”.

was a bit more open and interactive, leaving the door open to the possibility that things may not go exactly as planned. Here, I mostly focused on the very technical aspects of the standards and how they conceived the role of financial capitalism as a response to the global ecological crisis.

In conclusion, these observations involve three different ways of accounting for nature, which I also realised, or more precisely refined and conceptualised, when I participated in these events, meetings, and conferences. Moreover, they also involve different social groups, different expertise, different types of professionals and communities of actors, some points I realised, defined, and refined through back and forth between theory and empirics. In one of these sub-cases, natural capital accounting, quite different communities of actors were involved, the two most different being the “natural capital community”, named after the Natural Capital Coalition and its participants, and the ISO experts. My focus during these events evolved also during the thesis and depending on the event. While I focused much more on symbols and orchestration in sub-case 2 and in relation to natural capital accounting and the Natural Capital Coalition’s activities, it was also more and more the case as my thesis progressed, and in particular after I decided to submit the second paper of my thesis, which, as will be seen, precisely focuses on symbols and orchestration.

4.3.2 Interviews

I distinguish here between (formal) semi-structured interviews, which are planned in advance and usually conducted using an interview grid, and ethnographic interviews, which are conducted during observations and often improvised, in the sense that they are not planned in advance and are usually conducted as informal conversations.

4.3.2.1 Semi-structured interviews

Interviewing is a recognised research method in international relations particularly when it comes to studying the role of experts in a given field (Littoz-Monnet, 2017), and, for example, how they conceive the creation of measurement systems and equivalence conventions (Cussó & Piguet, Forthcoming, p. 237), or standards (Graz, 2019); as well as to examine how economic actors conceive their engagement in the politics ecological crisis (N. Taylor, 2022), or with an uncertain future (Best, 2014). Interviews help “discovering factual data, accessing certain types of information, and reconstructing a course of events or decision-making processes” (Albaret & Deas, Forthcoming, p. 125).

I did fourteen semi-structured interviews, mostly with people considered experts in the broad field of accounting for nature. Interviewees were small consultants, academics, UN and NGO staffs, Big Four employees, and experts from standard-setting bodies. They had expertise in environmental economics, environmental or financial accounting, financial analysis, and environmental science (broadly understood), or were sometimes involved in the more managerial functioning of one or another organisation. All of my sub-cases have been covered. I most often contacted people through e-mail, and sometimes through LinkedIn and Twitter, or directly during a meeting or event. After the first set of interviews (related to the ISO case), I selected my interviewees specifically in relation to some questions I had, throughout my thesis, often following certain events that had raised my curiosity about particular issues. Interviews have been conducted both online (via Zoom, Skype, and phone) and in-person. In-person interviews took place either during a conference with someone that I had previously contacted; in the interviewees’ office or place of work (most notably at the UN in Geneva); or in a hotel. The list of semi-structured interviews is available in Appendix 2.

I did not use the same standardised interview grid used for all interviews. The latter was almost entirely adapted to my interviewees and prepared a few days before, after having thoroughly researched the person and the organisation he or she was representing. The questions were also very different depending on when the interview took place, as my knowledge of the subject increased, and my research questions evolved accordingly. Just as for observations, I was not really aware, at the beginning of the interview process, of the differences between the methods promoted by the people/experts I interviewed, and interviews, just as observations, also helped in this regard to refine my object of study. The aim of the interviews and the questions asked thus changed a lot throughout the research. If, in the beginning, the objective was mainly to help me better understand the ins and outs of my object, particularly its technical dimensions, it was then mainly a question of completing my main source of data, namely observations. The questions were therefore refined over time. For instance, I increasingly focused on what was not really observable, in particular the interactions (or reasons for the absence of interaction) between the sub-cases, and thus between the accounting worlds, asking if they knew such or such accounting method or such or such initiative. Furthermore, it was also the opportunity to ask questions on the broader implications of accounting for nature as a response to the global ecological crisis, which was not always found through observations.

Appendix 6 presents the interview grid I used the most – for the three ISO experts. The latter interviews were designed to be quite structured and standardised, especially because they were conducted at the very beginning of my thesis. This very first interview grid has been prepared with Jean-Christophe Graz, who also came with me for the first interview of the thesis (another interview, the last one, was conducted with Valérie Boisvert, while the other twelve were

conducted by myself only). Two interviews were conducted in a less, but still structured way, because of the familiarity between the interviewee and the researcher(s)⁵².

Interviews have all been entirely transcribed when they were recorded. Only one interviewee, the one involved in the EFRAG standard-setting process for the EU sustainability reporting standards (third sub-case), refused to be recorded. I did not record the two less structured interviews either. Around half of the interviewees did not want their names to be mentioned but all agreed that the name of the organisation they were working for or involved in appeared. For general coherence, all names have been partly anonymised in this way – both in the thesis and articles. It is worth noting that the names have not been anonymised when I report the words that such or such actors, including sometimes one of my interviewees, had during public events or meetings. Some events and meetings were in contrast not public, particularly in relation to sub-case 1, and to the ISO standard-setting process. In those cases, I have proceeded to the abovementioned anonymisation.

Box 7. Referencing semi-structured interviews

In the next chapter dedicated to the analysis, I refer to the interviews as follows:

I = Interview

#1 = Number of the interview, classified in chronological order (here n°1)

-1 = Sub-case (here n°1)

For instance:

I#4-2 = Interview n°4, dedicated to sub-case 2

⁵² One was conducted at the end of the research with an IPBES expert and with Valérie Boisvert, who was close to the interviewee. The other was conducted with an expert in environmental economics from UNEP, with whom I had already worked before starting my thesis.

4.3.2.2 Ethnographic interviews

Formal interviews were essential at the beginning of my research to get involved in some of the above-mentioned sites (e.g., an interview allowed me to participate in the standardisation process of ISO). However, I rapidly regretted that the discourse of the interviewees was often the same. Accordingly, they were most often consensual. Conversely, the informal conversations I had during (in-person) observations were more interesting. It was in these situations that people criticised, for example, some discrepancy between discourse and practice, or raised the competition between diverging projects. This is also through informal conversations that I learned even before it was even public that the IFRS Foundation was planning to set standards for sustainability reporting (sub-case 3), speaking with a member of this organisation during the 2019 ISAR conference at the UN in Geneva.

These latter informal conversations can be labelled as “ethnographic interviews”. They “lie at the junction between interviewing and ethnography work, reflecting a moment of verbal exchanges, where researchers meet and talk with informants” (Kimber & Dairon, Forthcoming, p. 82). Although ethnographic interviews can sometimes be planned, in my case they always took place spontaneously. Sometimes I would start a conversation with a person I had already identified during the event (see Box 8 below). Sometimes, on the contrary, it was the person who had come to ask me questions (for example, when he or she saw my badge, asking me what I was doing there). If I saw that the conversation could also become interesting for me, I would try to direct it more specifically towards my research interests. Although I always had a list of questions in mind that formed the core of my thesis, such as the differences between the different initiatives, or the role of accounting for nature for such or such economic actor, I never really asked standardised questions but rather tried to lead a “normal” conversation.

Box 8. Dealing with studied actors' demands

During the 36th session of the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR), at the UN in Geneva, one high-level executive of the UN working at the United Nations Board of Auditors and coming from New York came to really sympathise with me after a conversation that I had started. This person was clearly enthusiastic about my project, as well as about the possible developments in relation to accounting for nature, here in relation to accounting for nature-related risks, the third accounting world. During this three-day conference, we had lunch together twice, and I had to insist on being freed from this person so that I could make my observations more freely. It was a tricky situation to deal with, especially as this person was trying to convince me to come to New York for a job that was opening up in the field of sustainability auditing.

I thus conducted fourteen ethnographic interviews. The list is available in Appendix 4. After each one, I tried to isolate myself immediately to take notes of the conversation, usually on my phone – notes that I then completed at the end of the day on my computer. As participant observation lends itself more to this type of ethnographic interviewing, since the researcher is directly involved as a participant, I conducted more ethnographic interviews with regard to sub-case 2, natural capital accounting.

Box 9. Referencing ethnographic interviews

In the next chapter dedicated to the analysis, I refer to the ethnographic interviews as follows:

EI = Ethnographic interview

#1 = Number of the ethnographic interview, classified in chronological order (here n°1)

-1 = Sub-case (here n°1)

For instance:

EI#11-1= Ethnographic interview n°11, dedicated to sub-case 1

4.3.3 Documents collection

A number of documents have informed my research. The aim of the document collection was primarily to reconstruct the history of the sub-cases, thus complementing the more

contemporary dimension of observations while allowing these sources to be cross-referenced with the information obtained during the interviews. Some documents are important for the novelty of the expert knowledge they convey. Others are for the institutional process they have helped to set in motion, in particular, to bring many actors to the table, and sometimes leading to the creation of new organisations. Some of these documents have even become iconic, in the sense that they are widely recognised, including in other documents, as milestones in the field of accounting for nature, and in relation to specific sub-cases. The corpus of documents is available in Appendix 4.

The key documents that helped me reconstruct the history of sub-case 1, environmental accounting, have been identified primarily through the reading of secondary literature (Bérard, 2019; Vanoli, 2013) and the guidance of my co-supervisor, Valérie Boisvert. As we shall see, accounting for nature, here embodied in environmental accounting, has been developed at the interface between international organisations and the academic world. The documents have thus been published since the early 1980s by international organisations, but also in academic journals, including by some people working in those same international organisations.

Documents collected in the context of sub-case 2, natural capital accounting, are more diverse. I have found them through the reading of secondary literature, the guidance of my co-supervisor, Valérie Boisvert, but also through my own interviews and observations. The documents presented here also helped me reconstruct the history of natural capital accounting since the late 1980s in terms of expertise mobilised in this accounting world, published both in scientific journals and by international organisations. But more recent documents have also a more symbolic character, especially when they are published by the Natural Capital Coalition or one of its affiliated organisations. The publication of a large number of documents, including

standards, progress reports or business cases, allows the organisation to have its status in this field recognised – each new publication being heavily promoted on social media and often leading to a dedicated meeting. In addition to the above-mentioned documents, documents collection in relation to sub-case 2 also include the ISO standards, and some publications related to their public communication. It is worth noting that the ISO standards are the only documents I used that are *not* available online. Indeed, one usually needs to pay to get access to an ISO standard (145 CHF for ISO 14008 on monetary valuation⁵³, and 124 CHF for ISO 14007 on environmental costs and benefits⁵⁴). I had access to the two standards, including their unfinished version, thanks to my participation in the standard-setting process.

For sub-case 3, I have collected the public documents of the IFRS Foundation and EFRAG that these organisations have been publishing since 2020 to prepare, and publicly explain, the setting of their respective standards. Since I also wanted to know more about the origins of accounting for nature-related risks, I have collected other documents published by different public and private actors that have, according to my interpretation, other sources, and reading of secondary literature, participated in the decision of financial accounting standard-setters to set such sustainability reporting standards.

The method used to analyse those documents is based on a content analysis of them. I have mostly tried to trace the evolutions of accounting for nature within these documents, and how they were representative of particular ways of accounting for nature. Documents often allow ideas to be circulated (Nay, Forthcoming). I have thus paid particular attention to the authors

⁵³ ISO. “ISO 14008:2019 Monetary valuation of environmental impacts and related environmental aspects”. 2023. <https://www.iso.org/standard/43243.html> (accessed March 30, 2023).

⁵⁴ ISO. “ISO 14007:2019 Environmental management — Guidelines for determining environmental costs and benefits”. 2023. <https://www.iso.org/standard/70139.html> (accessed March 30, 2023).

of these documents (both as individuals and as institutions). In the thesis, documents are used to provide contextual information, but are also mobilised as essential evidence of a particular process (ongoing or historical).

4.3.4 Social medias

Finally, Twitter and LinkedIn have also been great sources of information. Without necessarily going to the point of a “netnography” (Kozinets, 2015), I have spent much time, particularly on Twitter⁵⁵, identifying, collecting and classifying information diffused on social media by the studied organisations⁵⁶. As I will detail in the next chapter, Twitter is particularly important for the Natural Capital Coalition. This is primarily through this medium that the organisation promotes its reports, events, and any other advancement related to natural capital accounting, including by “re-tweeting” other organisations’ messages. During meetings of the Natural Capital Coalition, organisers often ask the participant to post on this platform and share their experiences. More mundanely, following the organisations I studied on Twitter allowed me to keep an eye on their different projects, how they were communicated (directly on their own website, or in the news media for example), and how the public (followers) reacted to them, as well as to check who those followers were.

To get information on the personal profile of these followers, and, more generally, of all actors I studied, LinkedIn⁵⁷, which is increasingly recognised as a powerful data source for social scientists (Beerli, Forthcoming), has been greatly helpful. Almost all the actors I met have a LinkedIn account. Many of them are consultants, and it is not surprising that the presentation

⁵⁵ Twitter. “About”. 2023. <https://about.twitter.com/fr> (accessed March 30, 2023).

⁵⁶ I classified the information according to the sub-cases, and then according to the following five main categories: if it aimed at making visible 1) the expertise of the organisation; 2) a new project; 3) another organisation; 4) an event before it happens; 5) an event while it was happening.

⁵⁷ LinkedIn. 2023. “About.” <https://about.linkedin.com/> (accessed March 30, 2023).

of themselves and their academic and professional backgrounds is important to them. I have used this information to understand the type of expertise mobilised for different projects and to objectify some possible recurrences in their backgrounds.

The data collected from social media is therefore mainly used in this thesis to provide contextual information or to discover new possible sources, such as documents, information about people, new projects or events. In a few cases, particularly in relation to the Natural Capital Coalition, social media data is considered part of the processes I have studied.

4.4 Data analysis

My sources are complementary. They allow an understanding of both the historical construction and the contemporary dynamics of each of my sub-cases, embodied in three accounting worlds. Documents and interviews are particularly used for the first objective, while observations, interviews and social media are more used for the second.

As the sub-cases emerged during the process of data collection and analysis, I started by qualifying precisely the data that I was collecting, and how they were part, or not fully part, of my object of study. Once the sub-cases have been defined and refined, each sub-case has been analysed through a content analysis first individually, and then compared through a cross-analysis (Klotz, 2008, p. 54). I analysed my data by making thematic files for each of the sub-cases. For each, categories were constructed throughout the thesis in a reflective manner. Examples of categories are: “data”; “measurement”; “metrics”; “use”; “strengths”; “failure”; “uncertainty”; “promises”; “expertise”; “audience”; – thus sometimes related to concepts, although not all of them were properly defined based on theory, a decision that was made before, during and after the data collection. I added data to these files throughout the thesis as

I collected them. I also added question marks where information needed to be filled in, and where more data had to be collected in relation to the questions I had.

For each of my sub-cases, I also had a category dedicated to relationships with other sub-cases, especially when people referred to other ways of accounting for nature or to other initiatives, or when people from one initiative were present at an event of another initiative. I focused on how people pass through one sub-case to the other, but also how ideas are taken, changed, and transformed in such a process (Nay, Forthcoming). While focusing primarily on what distinguishes these accounting worlds, I still try to identify possible linkages between them, which is discussed at the end of the next chapter. More generally, I always tried to make connections between the different events I was studying from the very beginning of my observations, even before the three sub-cases had been clearly articulated.

A content analysis helped me to provide both an in-depth understanding of each sub-case and a unique comparison between the three of them. At first, the lack of coherence between the diversity of my data source in terms of people, expertise or content of the discussions and methodologies made me anxious, wondering what my research object really was about. It took me some time to understand that the specificity of my object was in fact its great diversity. In the following chapter, each of my sub-cases, which I will henceforth call “accounting worlds”, will first be described and analysed separately. However, I will also focus, at the beginning or end of a particular new accounting world, on how they relate to each other, particularly where this relationship illustrates an issue of tension and/or controversy. Finally, at the end of the chapter, I will discuss the three accounting worlds together, coming back in more detail on the use of the concept of “common worlds” proposed by Boltanski and Thévenot.

5. Accounting worlds for nature

This chapter is dedicated to the analysis of the three accounting worlds: environmental accounting, natural capital accounting, and accounting for nature-related risks – examined in this order. For each of them, I start with the theoretical underpinnings of the accounting world. Then, I explain how such theoretical underpinnings have been institutionalised in different contexts, and by different actors. Finally, I mobilise more specifically my observations to analyse the contemporary embodiments of the accounting world. I conclude this chapter by discussing the commonalities and differences between those three accounting worlds, notably by coming back to Boltanski and Thévenot’s concept of “common worlds”.

5.1 Environmental accounting

This sub-chapter is dedicated to the historical and contemporary analysis of the first accounting world, that of environmental accounting. I will first discuss the theoretical foundations of environmental accounting inspired by a heterodox approach to economics. Second, I will present the historical developments and the institutionalisation of environmental accounting since the early 1980s. Finally, based on observations, I will explain how environmental accounting is discussed today and enmeshed in a debate between a fringe of statisticians working mainly in international organisations who wish to move closer to the second accounting world in search of “policy relevance”, and another fringe of more “traditionalist” statisticians working mainly in Western (especially European) national statistical offices who wish to maintain the emphasis on the historical approach to environmental accounting.

5.1.1 Theoretical foundations: A counter-hegemonic agenda

The question of how to measure the dependences of economic activities on natural resources and the dynamics between the two was already raised in the late 19th century. The “other Austrian school of economics” developed from the 1910s onwards by two Austrian thinkers whom Martinez-Alier (1987) describes as “left-wing social energeticists”, proposed a heterodox approach to economics based on “the accounting of the flows (and stocks) of matter and energy that are relevant to concrete production processes” (Franco, 2020, p. 456). As will be detailed below, this approach is still used today by scholars who underline the “limits to GDP” when it comes to reflecting environmental damages, their inequitable global distribution, and their relationship to global trade flows⁵⁸.

⁵⁸ Particularly at the Vienna School of Social Ecology, at the Institute for Ecological Economics of WU Vienna, and at the Universitat Autònoma de Barcelona.

On the one hand, research on *energy flow accounting* assesses the flows of energy according to different scales and metrics commonly used in thermodynamics. The output is “the amount of energy used by socioeconomic systems” (Fischer-Kowalski et al., 2011, p. 856). On the other hand, the most commonly used, *material flow accounting*, is inspired by “Odumian” ecology⁵⁹ and objectifies the metabolic relations that different nations have with matter (Fischer-Kowalski et al., 2011; Haberl et al., 2016). As a counterpoint to the “wealth of nations”, material flow accounting proposes to reflect the “weight of nations” (Fischer-Kowalski, 1998; Matthews, 2000). In this type of analysis, material flows are compared with each other and measured in terms of their mass, expressed in tones. These methods provide information on the environmental and, indirectly, political implications of global economic activities – the latter relying on the environment while, at the same time, unequally degrading it. This representation of nature as physical aggregates of national economies has been argued, including by mainstream conservation organisation such as the World Resource Institute (WRI), to be necessary to monitor the status and progress of “sustainable development” in nations and then compare them globally.

“Standard economic indicators – those that describe the financial flows in an economy – provide incomplete information on the environmental consequences or implications of economic activity. There is an urgent need for new information tools and new metrics if we are to monitor progress toward the development of more ecoefficient economies and long-term sustainability. Indicators should measure the physical dimensions of national economies, not just their financial dimensions”. (Matthews, 2000, p. v, report of WRI)

⁵⁹ This appellation is a tribute to the Odum’s brothers, Eugene and Howard, often considered as the fathers of “ecological engineering” (Devictor, 2018; Mitsch, 2012). Howard, for instance, explains that a “new enterprise, ecological engineering, is required to fashion synthetic systems partly under old energy budgets of nature and partly with special power take-off from civilization” (Odum, 1962, p. 57).

Such (bio)physical indicators can be easily linked with conventional economic representations. For instance, the evolution of GDP is compared with the quantities of materials or energy used to produce it. From this view, nature is considered captured and appropriated in a differentiated and inequitable manner by economic activities, and by nations themselves (Hornborg, 1998).

Also reflected in “ecological macroeconomics” models (Rezai & Stagl, 2016), environmental accounts allow finding evidence of the (im)possibility of decoupling environmental impacts from economic growth, i.e., continuing economic growth while reducing environmental impacts. They can also show how a decoupling process in the global North hides the exportation of environmental impacts in the global South (Hickel & Kallis, 2019). By making comparisons between nations possible, they reveal “unequal ecological exchanges”, i.e., “an economic system that produces ecologically unequal trade” (Joan Martinez-Alier, 2017, p. 167) – in the light of a structuralist and Marxist political economy (Frank, 1959; Hornborg, 1998). A recent study, for instance, has shown that in the global North, 55% of all material consumed comes from the global South. Conversely, in the global South, only 6% of all material consumed comes from the global North (Hickel, Dorninger, Wieland, & Suwandi, 2022). It thus comes as no surprise that those who develop and use these sorts of accounting methods for nature “mistrust national macroeconomic accounting and [propose to] go Beyond GDP” (Martínez-Alier, 2012, p. 62). They call for the creation of a new international accounting infrastructure followed in all economic and political decisions, based on this proposition of reflecting environmental implications of economic activities. While this proposal may seem illusory today, it was considered a serious option in the 1990s, leading to dedicated international institutions.

5.1.2 Institutional developments: The UN System of Environmental Economic Accounting

Early and extensive institutionalised experiments with alternative environmental accounts have taken place in some European countries, such as the Netherlands and Norway (Alfsen & Bye, 1990; Haan & Keuning, 1996). In France, the development of natural heritage accounting is decided in 1978 (Lefeuvre, 2015). This brings together three systems of accounts devoted respectively to elements (subsoil resources, marine, and continental waters, atmosphere), ecozones (land-use planning and the state of ecosystems), and agents (in connection with the uses of nature and environments), all measured according to biophysical metrics. From the 1980s onwards, many national and international statistical offices have looked for the development of environmental accounting methods (Ahmad, El Serafy, & Lutz, 1989; El Serafy, 1997; Kokkelenberg & Nordhaus, 1999; Lutz, 1993; Uno & Bartelmus, 1998). To take environmental damage into account in (macro)economic processes, several solutions are considered and discussed in Europe, in the United States, and at international conferences under the aegis of the World Bank and UNEP, some advocating the development of a so-called “Green GDP” revised downwards to take into account the damage caused to the environment by the overexploitation of natural resources (Repetto, Magrath, Wells, Beer, & Rossini, 1989). Future expenditures to prevent environmental damages and restore the environment would thus be deducted from states’ GDP.

Another solution is considered: satellite and (bio)physical accounts measuring the environment primarily in biophysical units. Satellite accounts are defined as “sets of national physical accounts that can be used alongside national monetary accounts” (Matthews, 2000, p. v). They are used as alternative indicators, in the same vein as the Sustainable Development Goals (SDGs), but with the difference of perhaps one day being included in GDP depending on the

improvement, acceptance, and international use of the methodology – unpaid household is another example (DeRock, 2019). They are officially “used to explore new methodologies and to work out new accounting procedures that, when fully developed and accepted, might become absorbed into the main system over time”⁶⁰. At the Rio 1992 Earth Summit, the decision is taken, and underlined in one of the eight texts resulting from this international conference, Agenda 21, to develop international satellite accounts for the environment, viewed first as “a complement to, rather than a substitute for, traditional national accounting practice” (United Nations Conference on Environment and Development, 1992, p. 73). The door is left open in Agenda 21 to the possibility that this satellite system, once developed, approved, and used at an international level, could be integrated directly into GDP (ibid).

The further development of this satellite system of environmental accounting is given to an organisation traditionally in charge of developing GDP: The United Nations Statistical Division (UNSD). Environmental accounting was already debated at UNSD due to two economists whose work has shown an interest in the “limits of GDP” since the late 1970s (Bérard, 2019, p. 70). With another economist from the Federal Statistical Office of Germany, they published one year before the 1992 Rio Summit what was to become the foundation of the UN methodology for environmental accounting – the System of Environmental Economic Accounting (SEEA). In this article entitled “Integrated Environmental And Economic Accounting: Framework for a SNA Satellite System” (Bartelmus, Stahmer, & Tongeren, 1991), the authors apply the core concepts, categories, and principles of the System of National Accounts (SNA), the internationally accepted standard for GDP⁶¹, to environmental issues.

⁶⁰ Eurostat. “Glossary: Satellite account”. (2019). https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Glossary:Satellite_account (accessed April 15, 2023).

⁶¹ UN Home, Department of Economic and Social Affairs, Statistics Division. The System of National Accounts (SNA). (2023). <https://unstats.un.org/unsd/nationalaccount/sna.asp> (accessed April 10, 2023).

Inspired by material and energy flow accounting but convinced that this accounting system is not incompatible with monetary GDP accounts, they propose a system “by which comprehensive physical resource accounts could be linked to the monetary balance sheet and flow accounts”. The significance of this project is increased by the fact that the SNA was in a revision process. Authors explain that “[t]he current revision of the SNA presents a unique opportunity to examine how the various concepts, definitions, classifications and tabulations of environmental and natural resource accounting can be linked to or incorporated” (Bartelmus, Stahmer, & Tongeren, 1991, p. 113)

In 1993, UNSD publishes an “interim version” of the methodology largely based on the above proposition. The preface to the report states that “[a] consensus emerged in the workshops to the effect that enough progress had been achieved to develop the links between environmental accounting and the System of National Accounts (SNA)” (United Nations Statistics Division, 1993, p. iii). However, theoretical and methodological disagreements remain regarding the choice of some metrics, the consideration of certain natural elements, and the use of monetary valuation methods (ibid, p. 24). Ultimately, the SEEA is not even approved as a satellite standard at this stage. A new (and informal) body of experts is set up in 1993 to find solutions to these technical disagreements by the statistical office of Canada and Eurostat – the London Group on Environmental Accounting (hereafter, London Group). A new version is jointly published only ten years later, in 2003, by the UN, the European Commission, the IMF, the OECD, and the World Bank, all involved in the London Group. In 2005, the mission to “elevate the System of Environmental-Economic Accounts (SEEA) to an international statistical standard”⁶² – which does not mean that it would be included in GDP, but just that it is

⁶² System of Environmental Economic Accounting. “UN Committee of Experts on Environmental-Economic Accounting (UNCEEAA)”. (2023). <https://seea.un.org/content/un-committee-experts-environmental-economic-accounting-unceea> (accessed April 10, 2023).

internationally recognised as a satellite account – is given to a new entity, the United Nations Committee of Experts on Environmental-Economic Accounting (UNCEEA).

SEEA is finally recognised as an international standard in 2012, with many references to the SNA for certain categories and principles under which nature should be accounted for (United Nations, 2014a). However, for the two standards to be finally reconciled in the future, the SEEA first had to be widely used to “make the case” for the relevance of this new standard as macroeconomic statistics (I#8-1). As put forward by the Head of National Accounts at the OECD, “it is very important to have these data; otherwise, what we say about the SEEA is just an empty shell” (O#8-1-D). In order to do so, States had to develop their internal capacity for environmental statistics and collect data in accordance with the standard (O#8-1-D).

The production of environmental statistics and accounts requires a large amount of data, much more than traditional macroeconomic accounts, i.e., GDP. In order for measurements to be made on anything other than a sporadic basis or in pilot projects, it is therefore imperative to have information systems that allow for systematic and regular data collection and capabilities that are distinct from those required for the production of conventional national accounts. Since the standard has been set, most discussions about the SEEA thus come up against one issue: that the national statistical authorities collect data both annually and correctly, i.e., rigorously following the methodology (O#8-1-D). Someone from Eurostat explained for instance that the EU has the power the force countries to collect data according to a standardised methodology. However, he also underlined that it takes time, more precisely “around ten years to change the data collection framework, then ten years for it to be properly implemented” (O#21-1-D). While EU countries are now implementing the SEEA, only 16% of States are considered to have “met

the target”, and 56% do not report any relevant information⁶³. As explained by the Director of the Pan African Federation of Accountants, most African states, for instance, do not have the technical capacities to even apply correctly traditional accounting standards⁶⁴ (O#6-3-D), and it has even been explained that it is complicated to have access to environmental statistics in Africa (O#16-1-D). While international organisations, such as the World Bank or FAO, provide technical assistance for the implementation of the SEEA, including training courses and so-called “knowledge transfers”⁶⁵, the results often remain sporadic projects and not annual accounts. Thus, institutionalisation, even within a UN framework, does not guarantee that environmental accounting standards will be disseminated to the intended audience.

5.1.3 Deciding between “policy-relevance” and “scientific objectivity”? Valuation and its controversies

SEEA still gives rise to intense discussions between experts within a UN context. These experts often refer to themselves as the “statistical community”. They distinguish them from many other actors of accounting for nature, in particular those linked to the second accounting world and a “natural capital community” which I will introduce later (O#21-1-D). Such a statistical community is primarily made of experts in environmental statistics, holding senior position within national statistical administration (e.g., “head of statistics”), or international organisations such as UNEP, the World Bank, Eurostat, FAO, or the OECD (e.g., “lead statistician”). They are thus high-level national and international bureaucrats with what can be

⁶³ CBB. “Aichi Target 2”. (2023). <https://www.cbd.int/aichi-targets/target/2> (accessed April 2, 2023).

⁶⁴ This remark was made in the context of financial accounting standards. However, it was made clear that in any context, the provision of more data, particularly complex ones, such as for the environment, was not the primary preoccupation of African states, who wanted to focus first on complying with traditional accounting standards.

⁶⁵ E.g., FAO. “Training on Environmental Economic Accounting and Greenhouse Gas Emissions”. (2016). <https://www.fao.org/food-agriculture-statistics/resources/resources-detail/en/c/1369241/> (accessed April 3, 2023).

qualified as “expert knowledge” of their field⁶⁶. These “technical entrepreneurs”, as I call them, are attached to the rigorous use of numbers and precise definition of concepts, which they often refuse to simplify for what they often consider as political reasons.

The major debate within the statistical community is directly related to this point, namely whether the SEEA should remain a standard of “scientific objectivity” or adopt language that is not considered “statistical” but supposedly “policy-relevant”. This debate crystallises around the issue of monetary valuation, embodied in natural capital accounting, which in the 2010s has become a mainstay of environmental and conservation discourses, as will be discussed in the next sub-chapter. A first alignment was made in 2014 with the publication of a new method, which does not replace but complements the original SEEA. This method for ecosystem accounting (United Nations, 2014b) accounts for the services provided by “ecosystem assets”, first quantified in physical terms and then turned into monetary equivalents. Such methodology is labelled as “experimental”, which is not the same status of “international standard” as the original SEEA methodology, for which it took almost twenty years to acquire this status⁶⁷.

Since 2018, the SEEA-EA has been undergoing a comprehensive review process including a major consultation (UNSC, 2020). In this context, the London Group of Environmental Accounting wanted to make a formal recommendation. At their annual meeting in 2020, the debates were particularly contentious as it was decided whether the SEEA-EA methodology, which still had a so-called “experimental” status, could acquire the status of an “international standard”, like the original SEEA, now called SEEA-CF, for “Central-Framework”.

⁶⁶ Data obtained through the LinkedIn profile of people that I have known through events (e.g., O#21-1-D; O#8-1-D).

⁶⁷ The original SEEA had the “experimental” status from 1993 to 2012.

Indeed, some statisticians strongly disagree with nature valuation techniques, the ones proposed in the SEEA-EA. As mentioned, the “statistical community” is primarily defined in opposition to others, particularly to environmental economists providing the basis of knowledge for the second accounting world, that of natural capital accounting. “As statisticians, we try to define/use terms in a scientifically sound way, not just undergo common language” (O#21-1-D). This statement made by a European national expert was precisely intended to disqualify the use of the term “natural capital accounting”, viewed as unscientific. This reflects a divide also within the statistical community between, on the one hand, those working more particularly for international organisations and who try to “generalise” or “mainstream” the use of the SEEA, particularly in countries of the Global South, and who support nature valuation for its “policy-relevance”; and, on the other hand, national experts who do not have this policy agenda and remain attached to the traditional language and concepts of statistics. The latter argue that “valuation is not our job”; that “valuation is outside the scope of statistical offices”, but also that “valuation is ideology-laden” (O#21-1-D), and thus again non-scientific. This latter point has prompted much debate at the London Group meeting, illustrated by the following transcript of a conversation on the chat (O#21-1-D):

A: There are strong POLITICAL arguments against valuation. Are we all aware that there is a strong connection between so-called “technicalities” [i.e., valuation techniques] and the results?

B: This is why it’s so important to make the case for natural ecosystems accounting in non-monetary terms, such as simply the number of people who depend on a particular service.

C: So you suggest to introduce a new unit for the ecosystem services? Then we just have to be sure that not some strange economists create a conversion rate towards the \$”.

Again, nature valuation is framed as “unscientific”, driven by “strange economists” who believe to be able to put a value on everything. In contrast, statisticians argue that “there are some things we can measure, but others that we cannot measure” (O#8-1-D), which is also a direct reference to my argument on “limits”, and the fact that in some situations, “calculation techniques are considered as insufficient to assess or measure the future” (Maechler & Graz, 2022, p. 625).

But another participant from an international organisation justified its own use of the concept as a means to communicate about the methodology beyond the statistical community: “the term natural capital accounting has taken its own life and each expert/community has its own view. We have to accept it. But yes, it is not defined. We do not have it in the statistical world. We [in her/his international organisation] use it when reaching out to a broader community” (O#21-1-D). International organisations’ staffs are indeed confronted with more direct political demands, and the difficulty of making some countries use a method that is considered as difficult to access due to its complexity. As we shall see in the next sub-chapter, natural capital accounting is largely viewed as “policy-relevant [...] it is important for fundraisers and policymakers who are familiar with it”, as summarised by a UNEP staff member involved in promoting the implementation of the SEEA into countries (I#4-2). Others explain that “decision-makers want monetary valuations”, “it is much easier to communicate with decision-makers with monetary data, and when the frame is natural capital accounting”, “[my international organisation] has an increasing request from countries for monetary valuation of their natural resources and ecosystem services” (O#21-1-D).

Through monetary valuation, some feel that they will be able to contribute to other international policy agendas, in particular the post-2020 global biodiversity framework debated in the context of the Convention on Biological Diversity (CBD), which is closely linked to monetary

valuation, as will be further discussed in the next sub-chapter. “Do we want to be included in the biodiversity regime? Because no one will wait for us. If we wait too long to offer a tool [the SEEA-EA as an international standard], we will be out of the game. The demand is there and if we don’t work with others, we become irrelevant” (O#21-1-D). The SEEA-EA, embodied into nature valuation, is thus almost viewed as existential for the “statistical community” in its ability to remain (if it has ever been) what a participant to a meeting has called “the statistical authority” for the environment (O#21-1-D).

During the 2020 London Group meeting, the crux of the debate was whether the SEEA-EA should acquire the status of “international standard”, in contrast to the existing “experimental” status, with the same two fronts between national versus international statisticians. “I cannot see how there will be an agreement on a standard for valuation”, explained a national statistician. “How can we call it ‘standard’ if we neither agree on the method nor it is widely used?”, put forward another, to which an international organisation’s statistician replied that “a standard is not an obligation, but it provides a common framework” (O#21-1-D). As the SEEA-EA is composed of two distinct parts, with a first part on the physical measurement of ecosystems, and a second part on their monetary valuation, a solution, or compromise, was already on the table: label the methodology “standard” only for the first part, while keeping the label “experimental” for the valuation part. This seemed to be a good compromise for everyone, including statisticians from international organisations, who could still call it a standard for their own use, which is good because “people take it much more seriously, especially in the South [...] Experimental gives the impression that it is too new to be applied” (O#21-1-D). Although it was decided that the London Group would make such a recommendation to the UNSC, this is then to the UNSC and its twenty-four member countries to make a formal

decision⁶⁸. As shown below, UNSC’s decision takes the same distinction between the different statuses of the two parts of the methodology, although the status of “experimental” was removed from the title of the overall methodology.

“[UNSC] Agreed to remove the ‘Experimental’ from the title of the revised SEEA Ecosystem Accounting, adopt chapters 1-7 describing the accounting framework and the physical accounts as an international statistical standard, keep all chapters together in one document, with chapters 8-11 describing monetary valuation and integrated accounting for ecosystem services and assets, and chapters 12-14 describing the applications and extensions, and regularly evaluate and report on the usefulness and pertinence of the accounts [...] Requested the Committee to make clear the different statuses of chapters 1-7, 8-11 and 12-14, both within the introduction and the chapters themselves”. (UNSC, 2021)

Consequently, valuation techniques officially remained at an experimental stage, while the physical measurement of ecosystems acquired the status of an international standard. The methodology simply called “System of Environmental-Economic Accounting – Ecosystem Accounting” (United Nations, 2021), without any reference to “standard” or “experimental”, was published a few days later and publicised through an interactive live presentation by Elliott Harris, Chief Economist of the United Nations.

Yet, while the methodology itself strictly avoids mentioning the term “natural capital accounting”, which is an implicit reference to monetary valuation, the presentation was named “New system of natural capital accounting”. The whole speech of Elliott Harris was developed around nature valuation, explaining the relevance of “measuring the value of nature before it’s

⁶⁸ The Commission consists of 24 member countries of the United Nations elected by the United Nations Economic and Social Council on the basis of an equitable geographical distribution.

See: United Nations. “United Nations Statistical Commission”. (2023). <https://unstats.un.org/UNSDWebsite/statcom/> (accessed April 3, 2023).

too late” (O#39-2-D). Accordingly, questions from the audience focused solely on monetary valuation, either supporting or opposing it. The strong debates between statisticians regarding the use of the term “natural capital” and the mere fact that nature valuation techniques had not acquired the same status of an international standard as the physical measurement of ecosystems was simply not mentioned. His speech was rather a plea for monetary valuation: “If we put a value on nature, then we will measure it. If we measure it, we can manage it. If we manage the value, we avoid destructing it” (O#39-2-D). While this sequence is objectively incorrect, as the SEEA-SE methodology actually explains that nature needs first to be physically measured before eventually being valued (which is even not a required step), it also shows an important point that will be further developed in the next sub-chapter: nature valuation, embodied into natural capital accounting, has become a mainstay of environmental conservation discourses – even when it does not reflect the actual debates between experts⁶⁹.

5.1.4 Conclusions on environmental accounting

This sub-chapter has thus discussed the first accounting world, which originally aimed at providing counter-hegemonic indicators against GDP. Institutionalised at the UN level with a methodology – the SEEA – which acquired the status of international standard in 2012, environmental accounting is developed and discussed by a self-proclaimed “statistical community” of national and international senior-level bureaucrats. Yet these “technical entrepreneurs”, as I call them, face a major problem: states are not implementing the methodology, even as an internationally recognised standard by the UNSD.

⁶⁹ Monetary valuation or not, the main challenge of the SEEA, be it the SEEA-EA, remains its wide dissemination. The UNSC decision on the 2021 SEEA-EA methodology is “recognizing the challenges to compiling the accounts in practice (UNSC, 2021, p. 9).

In order to be more in line with a dominant discourse that I will trace in the next sub-chapter, and in an attempt to simplify the messages provided by the SEEA which was considered as “too complex”, an additional methodology on ecosystem valuation has been developed and published in 2012 in a still experimental status. Yet, nature (monetary) valuation was also deeply controversial within the statistical community, although statisticians from international organisations seemed more receptive to the argument of monetary valuation, viewed as able to deliver a more “policy-relevant message”, as they were also confronted with the very actual limits of some countries and their respective ability to comply with the SEEA. These statisticians thus needed to be equally technical and meaning entrepreneurs, one of them explaining that “we need to think more about what we do about our data, what narratives and stories we want to do with our data” (O#21-1-D).

During the revision of the SEEA-EA, which was originally aimed at giving this methodology the same status of international standard as the original SEEA, a compromise was found: only the part on the physical measurement of ecosystems should acquire the status of international standard, while the part on valuation remains “experimental”. Confirmed by the UNSD decision, this decision is however totally overshadowed by the promotion of the methodology by the UN in its publication in March 2021, which on the contrary, only talks about the monetary valuation of nature allowed by this method, without ever differentiating the status issues (“experimental” versus “international standard”). Without following the debates, it is thus difficult to believe that the valuation of nature is controversial among experts who developed the methodology. We will see in the next sub-chapter that this episode is not surprising, nor isolated. The valuation of nature, notably embodied in natural capital accounting, has become the language of nature conversation, even though it is rarely embodied in practices, notably in those of experts. Rather than “technical entrepreneurs”, natural capital

accounting is shaped by “meaning entrepreneurs”, who succeeded to develop a powerful system of discourse and knowledge that subverts all exit strategies from the ecological crisis into valuation practices, a phenomenon, or process, that I propose to term as “valuation-centrism”.

5.2 Natural capital accounting

This sub-chapter is dedicated to the historical and contemporary analysis of the second accounting world, that of natural capital accounting. It is organised in a similar way to the previous sub-chapter. Based on primary and secondary literature, I will first discuss the theoretical foundations of this accounting world from the late 1980s, with emphasis on two key political entrepreneurs of this accounting world, namely David Pearce and Robert Costanza. Second, I will describe how natural capital accounting has been institutionalised, primarily by and through the international and/or transnational field of biodiversity expertise. Third, based on my empirical data and in particular my observations, I will focus on the contemporary embodiments of this accounting world, as led primarily by one actor: the Natural Capital Coalition, and the self-proclaimed “natural capital community”. This longer part of the sub-chapter will start with the second article of the thesis, which will be introduced and then discussed. Finally, I will explain why and how this accounting world is at the origin of what I call “valuation-centrism”.

5.2.1 Theoretical foundations: Ecological economics and nature valuation

5.2.1.1 David Pearce: *Accounting for the loss of nature as capital*

“One of the central themes of environmental economics, and central to sustainable development thinking also, is the need to place proper values on the services provided by natural environments. The central problem is that many of these services are provided ‘free’. They have zero price simply because no market place exists in which their true value can be revealed through the acts of buying and selling”. (Pearce, Markandya, & Barbier, 1989, p. 5)

The economic valuation of nature was originally based on theoretical justifications. It was developed in the early days of environmental economics by researchers who wanted to convince policymakers of the benefits of investing in nature conservation and fully incorporating

environmental concerns (Randall, 1988). Indeed, according to standard economic theory, economic agents base their decisions on prices, which summarise all the relevant information. They cannot make optimal choices if all the values they should include in their calculations are not reflected in the price system. Such is the case for environmental values, which would therefore only need to be expressed in monetary terms to be fully captured, thereby achieving optimal conservation outcomes (Pearce et al., 1989; Pearce & Moran, 1994). Environmental economist David Pearce, whose role as a broker of economic concepts in the political sphere has been widely recognised, was instrumental in bringing this concept into the public debate (Åkerman, 2003; Barde, 2007; Bateman, Barbier, & Barrett, 2007; Convery, 2007; Simpson, 2007).

In the context of the 1987 Brundtland Report “Our Common Future” and the subsequent 1992 Rio Earth Summit, states committed to translate the concept of sustainable development into more concrete decisions and actions. In this context, Pearce was commissioned to make recommendations for the UK government to make sustainable development “actionable”. The 1987 Brundtland Report already briefly engaged with the concept of “ecological capital” and the related limits of accounting standards in reflecting such a loss of capital: “incomplete accounting occurs in the exploitation of other natural resources, especially in the case of resources that are not capitalised in enterprise or national accounts [...] changes are required in all countries as part of a package of measures to maintain the stock of ecological capital” (United Nations, 1987, p. 42). Pearce will then make propositions to face such incompleteness of accounting.

With his colleagues Anil Markandya and Edward Barbier, he produced the report *Blueprint for a Green Economy* (1989), followed by *Greening the World Economy* (1991), *Measuring*

Sustainable Development (1993), and *Capturing Global Environmental Value* (1995). “No definition is ever satisfactory ‘tight’ and the Brundtland report is not consistent throughout the text as to what it means by sustainable development”, they explain. They continue by emphasising that “we are concerned to investigate some of the economic underpinnings of the idea of sustainable development: to ask, in other words, whether economics through lights on the meaning of sustainable development and whether it is a feasible, practical concept” (Pearce, Markandya, & Barbier 1989, p. xiv). The main message to operationalise the concept of sustainable development is indeed to transform accounting, because “sustainable development does have implications for the way in which we record economic progress (the ‘accounting’ framework)” (Pearce, Markandya, & Barbier, 1989, p. xv). They consider that economic progress is not one when it involves nature loss. Nature is therefore considered here as a stock of natural capital consumed by economic activity, which means that nature as capital contributes to economic welfare, but is not sufficiently considered as such, precisely because it is not accounted for.

But these reports, in contrast to the ones published during the same period within the first accounting world of environmental accounting by statisticians, are not only technical guidelines for experts. In these reports, the authors also distil economic knowledge for the general public and draw up rules and recommendations tailored for policymakers with a true talent for popularisation and a definite sense of formula and metaphor (Åkerman, 2003; Jacobs, 1995). With the skills of a both “technical” and “meaning” entrepreneur, Pearce acted as a broker of economic concepts in the political sphere (Simpson, 2007). He notably disseminated the concept of natural capital, whose proper valuation and further integration into national accounts would, he argued, make sustainable development actionable (Åkerman, 2003). In *The Economic Value of Biodiversity* (1994), co-authored with Dominic Moran, he argues for the

monetary valuation of nature as a means of convincing people that conservation can be economically sound. He also draws attention to the need to ensure that local communities have access to a sufficient share of revenues from conservation to cover the associated opportunity costs. In a pragmatic vein⁷⁰, he, therefore, pleads for the use of monetary arguments to ground and guide conservation policies (Pearce & Moran, 1994). This is a departure from economic orthodoxy, whereby monetary valuation reveals nature to market forces and hence enables it to be governed effectively. For this reason, Pearce stands less as a theoretician than as an instigator of what has come to be regarded as economic common sense in relation to nature conservation. As well reported by Convery (2007), Pearce and his colleagues were commissioned as experts by the World Bank and the OECD and were involved in the International Panel on Climate Change (IPCC) which contributed to a wide dissemination of their views and framing of environmental issues⁷¹. Moreover, as shown by Boisvert and Foyer, many environmental economists in international institutions – particularly the World Bank and OECD, but also UNEP and Eurostat – were trained in environmental science and engineering in the United Kingdom during the 2000s, and were exposed to this particular form of applied economics and took part in its diffusion (Boisvert & Foyer, 2015). According to Simpson (2007, p. 97), Pearce’s contribution to the economics of biodiversity has deeply influenced “both economists who developed an interest in biodiversity and conservation practitioners who came to appreciate the importance of economics”.

⁷⁰ “Pragmatic” is an adjective regularly used to describe Pearce’s approach to environmental problems (Convery, 2007; Simpson, 2007). For instance, Simpson (2007, p. 92) explain: “why is it important to put a value on biodiversity? Pearce’s answer to that question is largely pragmatic: we must put a value on biodiversity if we are to convince its guardians to incur the opportunity costs of its protection”; or “he probably would have described himself, accurately, as a pragmatist. His argument for conducting economic valuation was as a way of *getting things done*” (2007, p. 97, my emphasis). We shall also see latter that “pragmatic” is also used to define the overall project of valuing nature, what Spash (2009) defined as “environmental pragmatism”. I will come back on this notion in the conclusion.

⁷¹ As shown in the previous sub-chapter, most statisticians from international organisations, although not entirely convinced, are receptive to the “policy-relevance” argument of nature valuation.

Pearce's approach even managed to be quickly transferred beyond its initial audience of policymakers, economists interested in biodiversity, and conservation practitioners. A year after the first Pearce report was published, a private professional accounting organisation, *The Chartered Association of Certified Accountants* (ACCA), engaged in a reflection on the future of accounting in times of ecological crisis. This influential organisation of accounting (Ramirez, 2009) published a report entitled *The Greening of Accountancy: The Profession After Pearce*, drafted by the accounting scholar Rob Gray⁷². The report proposed to look at "how accounting and the accounting profession may set about contributing to the urgent process of environmental protection" (R. Gray, 1990, p. 19). The content of the report is basically the translation of Pearce's recommendation to value nature as capital for private accounting systems, primarily management accounting. Supporting Pearce's proposal, Gray explains that "[t]he pictures painted by accounting must be very partial pictures – it can only recognise those things which can be measured, which can be measured in prices, and which are exchanged for prices [...] This is the accountants' world. As we have seen, our accounting accepts this world as given, recording only those things which are made manifest through price" (R. Gray, 1990, pp. 31–34)⁷³.

Through Pearce's work, valuation as a practice has spread beyond the circles of economists who initially advocated it. Able to address different audiences, he combines the skills of a technical and meaning entrepreneur whose vision of conservation can be described as "pragmatic", or, taking the terms of the first accounting world, "policy-relevant". As the

⁷² Rob Gray later became a leading figure in the socio-environmental accounting literature, with one of the first specialist textbooks published in 2002 under the title *Accounting for the Environment* (R. Gray & Bebbington, 2002).

⁷³ It is worth noting that while Gray has continued to propose different ways to reflect nature in private accounting (R. Gray & Bebbington, 2002), he has become very critical of the ways in which private actors actually account for the environment (R. Gray, 2010).

previous sub-chapter shows, even statisticians, though sometimes reluctant, are confronted with nature valuation. Even accountants have embraced his proposals, although accounting standard-setters have then remained silent on environmental issues until 2020 (Maechler, 2022). This can be explained by the fact that as this approach has expanded, it has also taken on new meanings and rationales. In particular, it has become part of the tactical repertoire of contention of conservation biologists and other scholar-activists with a strong commitment to conservation.

5.2.1.2 Robert Costanza: *Expressing nature conservation imperatives through money*

As will be presented here, after the Pearce reports, the idea that monetary expression makes values perceptible and intelligible to decision-makers and the general public alike has gradually taken hold. Scholar-activists with a strong commitment to conservation have engaged in the production of ever higher and more impressive monetary numbers to raise awareness of the ecological crisis and affirm the dependence of human societies on nature. The localised practice of environmental monetary assessment, originally confined to public policy design and implementation (Jacobs, 1997), has assumed a whole new scope. This transformation towards a new totalising and heuristic perspective is particularly evident in the work and networks of Robert Costanza, one of the initiators of ecological economics (Costanza, 1989; Costanza & Daly, 1987), founder of the journal *Ecological Economics* and of the International Society for Ecological Economics, both in 1989.

Ecological economics, which emerged as a critique of mainstream environmental economics at the end of the 1980s, had in part been built around a critique of the monetary valuation of nature (Vatn & Bromley, 1994). An important aspect of the early research agendas in ecological economics was the search for pluralistic valuation procedures and alternative metrics to money

to account for the values of nature. Yet, from the end of the 1990s, some scholars distanced themselves from this critical program, judging it as too divisive and even doubting its policy-relevance (Jansson, Hammer, Folke, & Costanza, 1994). Arguing that the urgency of the ecological crisis required a rapid response and that “money talks” (T. Young, 2001), they embarked on global monetary assessments, completely detached from theoretical debates in economics. Thus, with the declared purpose of convincing policymakers to undertake proactive conservation policies, Costanza and his colleagues published – in 1997, in *Nature* – an estimate of the global value of natural capital and ecosystem services, based on rough typologies of ecosystems and associated services, the generalisation of a few localised monetary estimates, and the compilation of various studies. They justified this endeavour on the grounds that these values would not be “fully ‘captured’ in commercial markets or adequately quantified in terms comparable with economic services and manufactured capital”, which would be a reason for disregarding them in policy decisions (Costanza et al., 1997, p. 253). Their estimation of the global value of nature (US\$ 33 trillion per year) had been cited almost 30’500 times by April 2022, according to Google Scholar⁷⁴, which makes this article the most influential publication in ecological economics. This type of monetary valuation is based on rough typologies of ecosystems and associated services, the generalisation of a few localised monetary estimates, and the compilation of various studies. Both their results and the methods used have been fiercely debated and contested, as has the project in which they are embedded, which aims at nothing less than putting a price on the planet – which, according to its critics, testifies to a total loss of sense of proportion – “Next, the value of God”, commented two other ecological economists (Norgaard & Bode, 1998). Pearce, who himself reacted to the study by being supportive of the principle, but critical of the method, collected some of the reactions of other

⁷⁴ Google Scholar. “Robert Costanza”. 2023. <https://scholar.google.com/citations?user=EQ-mkaAAAAAJ&hl=en> (accessed April 3, 2023).

ecological economists: “Bad economics and bad ecological science”; “An aberration with the program of ecological economics”; Economists “know the price of everything and the value of nothing” (Pearce, 1998, p. 23).

While criticisms of this approach are widely shared among ecological economists, they have not had much resonance beyond the academic sphere. The practice of global ecosystem assessments has considerably expanded in the 2000s (Costanza et al., 2014; Daily, 1997; TEEB, 2020). Estimations result in ever higher numbers, with a record of US\$ 145 trillion reached by Costanza and colleagues (2014). Whatever their disciplinary background, their authors view their contribution to be primarily advocacy, not economics: they generally insist that their estimates should not be equated with prices, and that their intention is not to commodify nature, but simply to make it visible (Balmford et al., 2002), which would bring a concrete and practical “meaning” to nature conservation. As summarised by Goulder and Kennedy (1997, p. 23), “one may sense that nature routinely is undervalued. No matter how strong suspicions are along these lines, one cannot make a convincing case that nature is undervalued without having a philosophical and empirical framework for assessing nature’s values”.

As I shall see below, the practice of monetary valuation of nature and the discussion of its results have then become central in the international political and scientific arenas. They crystallise attention and debate. They now constitute an obligatory passage point in conservation discourse, to which both supporters and opponents refer, either to contribute to the production of numbers, or to contest it, for ontological, and primarily methodological reasons. For example, the above-mentioned article by Pearce in reaction to the 1997 article by Costanza et al. also contains the latter’s response, explaining that Pearce “is frustrated that our methods were not ‘pure’ and that we did not ‘get it right’ in terms of his two so-called

“principles of monetization.’ Unfortunately, Pearce himself did not get it right on these key points—at least in terms of what we did and he also misses an important distinction between microeconomic and macroeconomic analysis of the environment” (Pearce, 1998, p. 26). Although this 1997 study led to many reactions, this is the only response from Costanza that I found. Two things can explain such observation: Pearce’s authority in the nature valuation field, and/or the importance of directing the debates toward methodological issues, and simply ignoring the more epistemological ones. Doing so makes it possible to never question the principle of valuation, which in the following years will become unavoidable when talking about environmental issues, and, more particularly, biodiversity and ecosystems.

The fact that many critics of this “pragmatic environmentalism” (Spash, 2009) see this immoderate use of the monetary expression as the mark of a growing ideological and discursive, if not material, hold of the market, finance, and the private sector as a whole over nature (Büscher & Fletcher, 2015; Chiapello & Engels, 2021; Levidow, 2020; Sullivan, 2013; Tordjman, 2021) does not disqualify it. Initially considered a “necessary evil” (Åkerman, 2003), this strategy is now widely supported, in particular by the world of nature conservation, first and foremost by IUCN and WWF – the former being one of the founders of the Natural Capital Coalition on which I will amply come back below. The *Living Planet* reports published every two years by WWF make much of the monetary estimates of ecosystem services to support the alarming state of nature as if the mention of colossal amounts of money were necessary or even sufficient to raise awareness (WWF, 2018). Producing symbolic numbers has become detached from any concrete environmental considerations. “We have some very smart economists that can show the value of an elephant or a whale”⁷⁵, recently put forward by the head of the IMF,

⁷⁵ 2022 Annual Meetings of the International Monetary Fund and the World Bank Group. “Video”. (2022). <https://meetings.imf.org/en/2022/Annual/Videos?videoId=6313565463112> (accessed April 10, 2023).

as if it was enough to provide monetary values of “nature” to claim a role in environmental politics.

In the 2000s, the practice of monetary valuation benefitted from a much larger visibility by being institutionalised within a UN context in relation to the international field of biodiversity expertise, before being (re)connected to accounting. A key feature of this period is the direct inclusion of private actors in the drafting of some key reports of international expertise, reflecting a more general trend of partnership rather than confrontation with business in global environmental governance (Bäckstrand, 2006; Kenneth MacDonald, 2010; Paterson & Newell, 2010).

5.2.2 Institutional developments: The making of natural capital accounting in the international sphere of environmental expertise

The mainstreaming of natural capital accounting and monetary estimates into conservation science and policy arenas was completed thanks to the institutionalisation of this approach through the global assessments of biodiversity and ecosystem services in the early 2000s. Focusing on the global consequences of ecosystem change for human well-being, the “Millennium Ecosystem Assessment” (MEA), launched in 2003 by the then UN Secretary-General Kofi Annan, brought together academics and practitioners to reflect on the best ways to protect nature. The MEA was a major moment in rallying scientists to the project of valuing nature. It was an institutional response to the demands of scientists and policymakers involved in the work of the international conventions on biological diversity and desertification, who lamented the lack of an assessment process comparable to the IPCC (Hrabanski, 2017; Vadrot, 2014).

The assessment process was supported by international organisations, designed under the scholarly authority of world-renowned scientists, and involved 1'300 authors from 95 countries representing all relevant disciplines (information available in the report: MEA, 2005). One of the co-chairs of the Board of Directors of the MEA is now a well-known figure of environmental expertise: the British chemist Robert Watson, who was at that time Senior Scientist at the World Bank. Previously, he was co-chair of Working Group II of the Intergovernmental Panel on Climate Change (IPCC) and, more recently, chair of the Intergovernmental Platform on Biodiversity and Ecosystem Services (IPBES)⁷⁶. Among the fifteen leading scientists in the report is Partha Dasgupta, mentioned in the introduction of the thesis and to which I will return later, or Harold Mooney, one of the scientist behind the concept of “ecosystem services” (Ehrlich & Mooney, 1983). Many international institutions officially took part in the report, including IUCN, UNFCCC, CBD UNESCO, and UNEP. The MEA also included business organisations, represented first and foremost by WBCSD. According to Hrabanski (2017, p. 605), such inclusion of businesses “made it easier to disseminate the concept of ecosystem services”.

These multiple endorsements have ensured the legitimacy and the dissemination and adoption of the results without much controversy. Even Richard Norgaard, mentioned above for his harsh critique of the 1997 Costanza et al. study (Norgaard & Bode, 1998), now considers the MEA process as “a source of considerable hope”, as a “significant number of scientists learned how to deliberate together, combine their separate disciplinary frameworks, and form a collective analytical ability that was more than the sum of their individual contributions” (Norgaard, 2008,

⁷⁶ IPBES. “Curriculum Vitae Sir Robert Tony Watson”.
https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&cad=rja&uact=8&ved=2ahUKEwjyvaqDyo_-AhUuM-wKHeD5BIYQFnoECB8QAOQ&url=https%3A%2F%2Fwww.ipbes.net%2Fsites%2Fdefault%2Ffiles%2FCV_Bureau_2015_WEOG_Robert_Watson.pdf&usg=AOvVaw0MTA5VLR6X99R7iEvCoZwJ (accessed April 4, 2023).

p. 863). Indeed, as has been observed for comparable assessments, the final report and the summary for policymakers result from successive scientific, political, and diplomatic compromises, aimed at providing a scientifically well-established and policy-relevant consensus view on the subject under study (De Pryck, 2021). Consequently, discordant voices are neutralised before the reports are circulated. The MEA (2005) took up and thereby instituted the representation of nature as capital, essential to human well-being thanks to the production of ecosystem services already put forward by Costanza et al (1997). While stressing the importance of demonstrating the economic value of ecosystem services and developing techniques for representing stocks of ecosystem services in national accounts, the MEA stopped short of recommending the widespread use of market mechanisms for conservation. The dependence of human societies on the environment was largely expressed in biophysical terms. The experts did not go so far as to produce a global monetary estimate of the values of nature.

This step was taken a few years later by another major international initiative of environmental expertise. In 2007, a German proposal to study the “economic significance of the global loss of biological diversity” was adopted at the Potsdam G8(+5) environmental ministers’ meeting. This resulted in *The Economics of Ecosystems and Biodiversity* (TEEB) initiative. Hosted by UNEP in Geneva and closely related to CBD, the TEEB initiative has yielded several reports on its findings on biodiversity values targeted at different audiences (business and enterprise, policymakers at various scales, research and academia) (TEEB, 2010, 2011). These results were publicly presented at the 2010 Conference of the Parties to the CBD in Nagoya, which marks a clear momentum for the monetary valuation of nature and the strategy of partnership with businesses for the implementation of the global biodiversity framework (MacDonald and Corson 2012). This conference, COP 10 of the CBD, and the following Nagoya Protocol – often seen as the equivalent of the Kyoto Protocol, not for climate, but for biodiversity – was deeply

marked by such market-based and neoliberal thinking of nature conservation (Fuentes-George, 2013, p. 144). As well explained by MacDonald and Corson, “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” (MacDonald & Corson 2012, p. 175).

The TEEB Initiative was headed by Pavan Sukhdev, then Chief Economist at Deutsche Bank and now president of WWF International, who was chosen specifically because of his business connections and his ability to speak to people from different social backgrounds (MacDonald & Corson, 2012; Monfreda, 2010). Among the different reports produced by the TEEB Initiative, the 296-page report entitled “The Economics of Ecosystems and Biodiversity in Business and Enterprise” is arguably the one that got the most attention. Its main message was to urge companies to integrate natural capital into “corporate planning, accounting and reporting” (TEEB, 2010, p. 9). Beyond such a message, its main effect was to bring together a hybrid community of 114 stakeholders from 75 organisations including researchers, business representatives, and economists from national and international environmental administrations, under the guidance of the IUCN, to spearhead discussion and produce the report (information available in the report: TEEB, 2010). The drafting of the report was coordinated by Joshua Bishop, IUCN’s Chief Economist, who had previously experienced partnering with businesses⁷⁷, particularly extractive industries such as Shell, Rio Tinto, Total, and Holcim, all involved in the drafting of the report.

⁷⁷ Bishop indeed produced many reports for IUCN and its “business branch”, which included those actors in the drafting of the reports. See: IUCN. “Business, finance and economics”. (2023). <https://www.iucn.org/our-work/business-finance-and-economics> (accessed April 4, 2023).

As a practical result of these international initiatives and related framings, both internalised and supported by the business world, the monetary valuation of nature has gradually become commonplace, in stark contrast to the outcry among ecological economists over Costanza et al's 1997 paper. This can be explained in part by the procedures for carrying out such expert assessments. They involve a large scientific community, representing a wide range of disciplines and coming from different regions of the world, and even including some early critiques of GDP, globalisation processes, and unequal ecological exchanges that we would rather expect to see in the first accounting world. This is the case of the environmentalist and ecological economist Juan Martinez-Alier quoted at the very beginning of the previous sub-chapter. Monfreda (2010, p. 284) describes the presence of Martinez-Alier as an attempt of building "global knowledge" for biodiversity that "tends to re-articulate contradictory arguments in ways that may not be consistent with the intent of those who originally spoke them".

Moreover, the drafting process of the reports enlisted the stakeholders directly targeted by them – businesses –, which appears an effective way to ensure interest and ownership of their results. In addition to extracting industries, we can mention the presence of PwC and KPMG (two of the "Big Four" accounting, auditing, and consulting firms), chemical industries such as Syngenta or Dow, or banks and reinsurance companies (the list of authors is available in the report: TEEB, 2010). The TEEB initiative was accordingly an important moment in the consolidation of the monetary valuation of nature as a privileged – if not exclusive – means of grasping the importance of conservation and of implementing actions in this regard. Although the term "natural capital accounting" is not explicitly mentioned in the reports, all the ingredients were there: the monetary valuation of nature as capital, the proposition to include nature in both public and private accounting, the inclusion of business as co-participants, or the

staging of the report itself at the Nagoya conference (MacDonald & Corson, 2012). Those elements are still central when it comes to how natural capital accounting is orchestrated as a response to the ecological crisis. The term “natural capital accounting” will then really take hold two years later, at the 2012 UN Conference on Sustainable Development, or Rio+20: “Massive Show of Support for Action on Natural Capital Accounting At Rio Summit”, headlined the World Bank on its website, explaining that natural capital accounting should in particular favour “managerial decisions based on respect for the environment”⁷⁸.

Developed as a policy-relevant and pragmatic project for nature conservation in the late 1980s by David Pearce and his co-authors, the practice of nature valuation has then turned into the production of ever higher numbers around the circles of Robert Costanza. This project has then been institutionalised in a UN context through two major international assessments of biodiversity and ecosystems. Including businesses directly in the drafting of the reports, these assessments made nature valuation enter the unexplored areas of corporate governance and reporting, in the shape of natural capital accounting. This business-oriented component has endured and in 2014 evolved into an independent network, the Natural Capital Coalition, which is dedicated to the “mainstreaming” of natural capital accounting.

5.2.3 The contemporary politics of natural capital accounting

I focus here on the contemporary embodiments of natural capital accounting, from 2014 to the present, drawing in particular on my observations. I will start by introducing the Natural Capital Coalition, and the different resources this organisation mobilises for making natural capital accounting a continuous discussion – or conversation – in nature conservation circles,

⁷⁸ World Bank Group. “Rio+20: natural capital accounting and the wealth of countries”. (June 15, 2012). <https://www.worldbank.org/en/news/feature/2012/05/30/rio-20-natural-capital-accounting-feature> (accessed April 15, 2023).

particularly in Europe. I will then introduce the second paper of my thesis specifically devoted to this organisation and in particular to its annual meeting, the European Business and Nature Summit (EBNS). Then, the discussion of this article will focus on the way in which the Natural Capital Coalition is involved in what I call “a performance of immobility and recommencement”, notably by disqualifying competing initiatives such as ISO standards and by organising a series of activities around natural capital accounting that give the impression of progress and dynamism. Finally, I will discuss how the long-standing proposal for nature valuation and natural capital accounting, originally conceived in the late 1980s, has become an unavoidable point of departure even for its opponents, and which I summarise under the label of “valuation-centrism”. By way of illustration, I will show how two separate international reports of biodiversity expertise engage distinctively, but engage nonetheless, with nature valuation.

5.2.3.1 The Natural Capital Coalition: From “accounting” to “thinking”

The Natural Capital Coalition arose from a willingness to build on the outcomes of the TEEB for Business and Enterprise report. This required transforming this hybrid forum associated with a specific report into a perennial “natural capital community”, as its members call themselves, committed to the operationalisation and practical implementation of natural capital accounting. Unlike the “statistical community” mentioned in the previous sub-chapter and active in the first accounting world, there are no implicit definitions or rules of membership, such as expert knowledge of a given field, to be part of the natural capital community. Everyone can be part of it by actively participating in one of the many events organised by the Natural Capital Coalition or its affiliated organisations. As explained by a participant and independent consultant, the Natural Capital Coalition “is open to everyone and works quite well because everyone feels comfortable” (EI#8-2).

The Natural Capital Coalition was set up in 2014 by WBCSD and IUCN. The challenge was to move from awareness to action in relation to natural capital accounting. This official aspiration is reflected in its founding document, the Natural Capital Protocol (2016), which provides a roadmap of best practices for businesses wishing to engage in this path and to account for the value of their natural capital: “a framework designed to help generate trusted, credible, and actionable information that business managers need to inform decisions” (Natural Capital Coalition, 2016, p. 2). According to the Protocol, developing natural capital accounting practices should lead to “new ways of thinking about how your business relates to the natural environment” (2016, p. 107). This objective is relatively vague, which leaves room for interpretation. Objectives also change over time according to the different projects carried out by the different members of the natural capital community: “supporting businesses and the natural capital community to make valuing nature the new normal for businesses across Europe”⁷⁹; or steering what they usually call a “natural capital thinking [which] aims to secure the well-being of humanity by rendering decision-making more conducive to the conservation and restoration of nature”⁸⁰. The success of these objectives is rarely measurable. But if it was measured in terms of the number of events organised or presence on social media, the objective would certainly be achieved. In other words, the natural capital community attracts attention. This helps explain the debates within the statistical community active in the first accounting world about whether they should use the same language of natural capital and monetary valuation to “get more actors on board, like the Natural Capital Coalition”, as one UNSD statistician said (O#21-1-D).

⁷⁹ We Value Nature. “About We Value Nature”. (2020). <https://wevaluenature.eu/About> (accessed April 4, 2023).

⁸⁰ We Value Nature. “Risks of perverse outcomes from accelerating natural capital thinking: A reflection”. (2020). https://wevaluenature.eu/sites/default/files/2022-04/We_Value_Nature_Natural_Capital_Thinking_Briefing_Paper.pdf (accessed April 4, 2023).

Drafted in line with the TEEB for Business and Enterprise report and with direct reference to it, the Natural Capital Protocol was steered by practically the same organisations and, above all, by the same people, including Joshua Bishop, who had in the meantime moved from IUCN to WWF Australia⁸¹, and – most notably – Pavan Sukhdev (information available in the report: Natural Capital Coalition, 2016). The circulation of these natural capital accounting brokers between different environment-related arenas supportive of nature valuation promotes the circulation of narratives, language, and framings. Pavan Sukhdev is probably the most emblematic example in this regard. After leading the TEEB initiative and then UNEP’s Green Economy Initiative⁸², he became the President of WWF in 2017. He is a Goodwill Ambassador for UN Environment and has served on the boards of Conservation International (CI), the Global Reporting Initiative (GRI), and the Stockholm Resilience Centre (SRC). He is also the founder and CEO of a consulting firm specialised in natural capital accounting, GIST Advisory, which has offices in Geneva, London, Mumbai, and Singapore⁸³.

One of the major supporters of the Natural Capital Coalition is the European Commission, apparently won over by the monetary arguments in favour of nature conservation. The TEEB Initiative was already proposed by the German government and supported by the European Commission⁸⁴. More recently, the 2019 *Green Deal* discusses the importance of “support[ing]

⁸¹ WWF Australia. “Joshua Bishop”. (2018). <https://www.wwf.org.au/about-us/meet-the-team/joshua-bishop> (accessed April 4, 2023).

⁸² UNEP. “Green Economy”. <https://www.unep.org/explore-topics/resource-efficiency/what-we-do/policy-and-strategy/green-economy> (accessed April 15, 2023).

⁸³ Bandung Institute of Technology. “Biography of Pavan Sukhdev”. <https://www.sbm.itb.ac.id/wp-content/uploads/2012/02/BioPavanSukhdev.pdf> (accessed April 4, 2023).

⁸⁴ Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection. “Study: The Economics of Ecosystems and Biodiversity”. <https://www.bmu.de/en/topics/nature-species-protection/nature-and-biological-diversity/international-biological-diversity/study-the-economics-of-ecosystems-and-biodiversity> (accessed April 4, 2023).

businesses and other stakeholders in developing standardised natural capital accounting practices within the EU and internationally” (European Commission 2019, p. 17). The deployment of natural capital accounting is largely driven, financed, and facilitated by the European Union and its institutions, and if it were to be implemented in a meaningful way, it would probably primarily affect European businesses. The European Commission played an important part in financing and shaping the political project of valuing and accounting for nature, in particular through a dedicated platform called EU Business @ Biodiversity Platform (EU B@B), which is a place where business can share best practices in relation to nature conservation and exchange with consultants⁸⁵. It was launched shortly after the TEEB initiative at a high-level conference on “Business and Biodiversity” in Lisbon in 2007. Most direct support to the Natural Capital Coalition is provided through programs – “We Value Nature” from 2018 to 2020⁸⁶, or “Aligning accounting approaches for nature” from 2021⁸⁷.

The Natural Capital Coalition’s stated vision is to bring together all potentially relevant parties – various experts, business representatives, consulting firms, or EU bureaucrats and politicians – and to put them on an equal footing for instance during conferences and events organised in a roundtable format (O#7-2-P; O#30-2-P). Horizontal and informal communication among individual experts is assumed to prevent authoritative postures, the assertion of institutional positions, and the expression of opposition. This format of engagement and communication based on the sharing of information is expected to foster a community of peers and a common language, without the need for substantive consensus. This communication takes place in two

⁸⁵ European Commission. “Business & Biodiversity”. https://green-business.ec.europa.eu/business-biodiversity_en (accessed April 4, 2023).

⁸⁶ European Commission. “We Value Nature”. <https://cordis.europa.eu/project/id/821303> (accessed April 4, 2023).

⁸⁷ European Commission. “Aligning accounting approaches for nature”. https://knowledge4policy.ec.europa.eu/news/aligning-accounting-approaches-nature_en (accessed April 4, 2023).

formats: regular online events, which I will describe here, and an annual conference, which I will present and analyse below by introducing the second article of my thesis.

Many online events and meetings are organised on a monthly basis, for instance during a “virtual office hour call” at lunchtime⁸⁸. Online events allow to maintain an “incessant discussion”. The beginning of any meeting is dedicated to the summary of the last one(s), while the end of the meeting is used to “tease” the next one(s). In other words, the primary activity of those involved in “the natural capital community” is either to organise or to participate in meetings – which leads to a so-called “meeting culture” (Van Vree, 2001).

A typical meeting is convened by the Natural Capital Coalition, IUCN, and/or WBCSD, joined by an expert, often a consultant either freelance or active in an international organisation. The participants, who are invited to introduce themselves at the beginning of the event, are, if I take the May 2020 meeting as an example, sustainability managers from the food industry or other sectors, policy assistants at the European Commission, technical advisors in the energy sector, project managers for another sustainability initiative or standard, sustainability assistants in the raw materials or pharmaceuticals sector, NGOs and UN employees, not to mention the many “independent consultants” (O#13-2-P). Participants are also asked the reason for their participation. In general, they are faced with concrete problems related to how to measure biodiversity. However, the meeting does not aim to provide a concrete set of biodiversity measurement tools, but rather to indicate the possibilities offered by natural capital accounting – what it could achieve if it was widely realised, and not how to achieve it. These events never spend time on technical issues, such as accounting rules and principles, measurement issues, or

⁸⁸ We Value Nature. “We Value Nature virtual office hour call”. (2020). <https://wevaluenature.eu/node/81> (accessed April 4, 2023).

monetary valuation techniques. Discussions focus on the benefits of these techniques, and how they transform the relationship between the organisation and the company, usually a business firm and its “stakeholders” (O#18-2-P). Online training courses with different levels of progress are available online⁸⁹, and then “practical examples” are discussed during those live online meetings (O#18-2-P). The goal is first and foremost to give meaning to this technical process, to bring it into some kind stories.

This point should be taken at face value. While speeches at meetings are often turned into stories (Maechler & Boisvert, Forthcoming), natural capital accounting has itself been turned into a comic strip by a consultancy organisation member of the Natural Capital Coalition, Valuing Nature. This comic strip, also titled *Valuing Nature*, is “taking the reader on a journey on the valuation of nature – potentially the key to a truly sustainable future”⁹⁰. The preface of the book comes back to the history of nature valuation: Costanza et al 1997’s paper, the 2005 MEA, the 2011 TEEB, and the 2021 Dasgupta Review on which I will come back later. Six personas, students, including Chloe, a 24 years old “Marxist-Feminist-Green”, or a 47 years old “disillusioned middle manager” with a “long career in the corporate world [that] has left him looking for answers” (Fish & McKelvey, 2021, p. xiv) are embarked into the task of realising a university assignment on the natural environment, during which they realise the many benefits of valuing nature. This way of communicating about accounting for nature contrasts sharply with the way the statistical community in the first accounting world approaches the issue, for whom simplification is often synonymous with oversimplification (O#21-1-D).

⁸⁹ We Value Nature. “Training resources”. (2020). <https://wevaluenature.eu/training-resources> (accessed April 4, 2023).

Coursea. “Valuing nature and people to inform business decision-making. By Capitals Coalition”. (2023) <https://www.coursera.org/learn/valuing-nature-and-people-to-inform-business-decision-making> (accessed April 4, 2023)

⁹⁰ Valuing Nature. “Valuing Nature Book”. <https://valuing-nature.net/valuing-nature-book> (accessed April 4, 2023).

Natural capital accounting, as conceived, imagined and promoted by the Natural Capital Coalition and its affiliated organisations, is therefore not so much about accounting as it is about a particular meaning given to environmental issues, which entails the development of a “natural capital thinking”. As we shall see in the dedicated article, this thinking is also conveyed by a number of documents that aim to complement the Natural Capital Protocol (Capitals Coalition, 2019, 2020; Natural Capital Coalition, 2018), documents that give rise to meetings dedicated to their presentation.

I have explained here that accounting for nature, here embodied into natural capital accounting, is not only a technical field of specialised knowledge but also relies on narratives and stories, as well as a shared sense of belonging to a community of actors. I will show below that it is also about delivering a performance, or a spectacle. This phenomenon is probably at its peak during the two-day annual meeting of the Natural Capital Coalition, the European Business and Nature Summit (EBNS).

5.2.3.2 Introduction to Article 1: Staging Nature

The second article of my thesis is part of a special issue in the journal *Valuation Studies* entitled “Valuation as a semiotic, narrative, and dramaturgical problem”⁹¹, for which I saw the call for paper in early Summer 2020. This was a few months after attending my first EBNS in December 2019 (O#7-2-P), which was decisive in giving me the idea (and the necessary material) to submit an extended abstract to the special issue’s editors. The EBNS is jointly organised by the Natural Capital Coalition and the European Commission through its EU@BB platform. As

⁹¹ See the call for paper here: Valuation Studies. “Theme Call. Valuation as a semiotic, narrative, and dramaturgical problem”. https://valuationstudies.liu.se/valuation_as_a_semiotic_problem (accessed April 4, 2023).

already mentioned in the methodology chapter, this Summit is organised annually in a major European city during the European “natural capital week”. It brings together people of the same type as the online meetings mentioned above. I focus here more specifically on the 2022 EBNS, as my observations from that edition have not been included in the article below in its current version, which focuses more specifically on the 2019 edition in Madrid (in between, editions have been happening online due to the Covid-19 pandemic). However, the different EBNS are organised in a similar way, and aim to convey similar messages in substance, although they may change in form.

The aim of the 2022 Summit was officially to create “momentum” ahead of the UN Conference on Biodiversity (COP15) to be held a few weeks later, in order to have a coherent European (business) voice at COP15⁹². The two-day conference included two keynote speeches, two opening plenary sessions, a closing plenary session, an undefined session named “positive nature stories”, three sessions in which three to five meetings were organised at the same time so that participants had to choose where to go, as well as other side events that took place throughout the day⁹³. Some sessions were recorded live on YouTube through a dedicated channel⁹⁴. Summaries, slides, and photos were then made accessible through a dedicated platform⁹⁵. As also put forward in the article for the 2019 EBNS, (long) coffee breaks

⁹² European Commission. “European Business and Nature Summit 2022. Programme”. (2022). https://environment.ec.europa.eu/european-business-and-nature-summit-2022/daily-programme_en (accessed April 5, 2022).

⁹³ European Commission. “European Business and Nature Summit 2022. Programme”. (2022). https://environment.ec.europa.eu/european-business-and-nature-summit-2022/daily-programme_en (accessed April 5, 2022).

⁹⁴ Youtube. “EBNS2022. EU B@B Platform”. (2023). <https://www.youtube.com/playlist?list=PLewiC5m17CZ2uJI64CWO8vokOI75pUvDg> (accessed April 5, 2023).

⁹⁵ CIRCABC. “European Business and Nature Summit”. (2023). https://circabc.europa.eu/ui/group/3f466d71-92a7-49eb-9c63-6cb0fadf29dc/library/3c0d9c48-9f82-4ccb-a758-f85ad445cdd6?p=1&n=10&sort=modified_DESC (accessed April 5, 2023).

punctuated the different sessions. Indeed, it is important to note that the people who participate in this Summit are there to listen as much as to talk and exchange with others.

Although natural capital accounting is on everyone's lips during these conferences, it is never discussed in technical terms. The emphasis is placed on "experiencing" nature as capital. At the beginning of the 2022 edition, participants were offered to "embark on a journey to nature positive", as was suggested on a big screen at the registration desk (O#51-2-P; and see an extract from my observation notes in the Appendix, with a picture of the screen). The introduction of the conference by the EU Commissioner for the Environment, Virginijus Sinkevičius, took over this message, explaining that "the journey is underway, and I am glad to be travelling with you" (O#51-2-P). As will be discussed in the article, the "journey metaphor" is frequently used, not only within the natural capital community, but also in the field of private sustainability in general, to symbolise a process that is constantly ongoing, but never entirely accomplished (Milne, Kearins, & Walton, 2006), meaning that it does not matter if we are not good, as long as we are in the process of change (or "transformation"). "What counts is not the measure; it is how we got the measure"; "We are good, but we want to be even better", are some of the phrases I heard that illustrate such a journey metaphor (O#51-2-P). From this view, it comes as no surprise that talks are also supposed to be "inspirational" and "motivational": "Transform yourself, go out of your comfort zone", was urging one of the speakers to the audience at the 2022 edition (O#51-2-P; see also Box 10, below). In general, these conferences are about "launching a discussion"; "positivity"; "organisational change"; "movement"; or "collaboration" (O#51-2-P). Failure to mainstream the use of natural capital accounting, or, more generally, to meet the biodiversity targets, can be mentioned, but always with the emphasis that this is not a failure, but an opportunity to do better in the future, in particular through self-imposed standards, not through rules of law. "Regulation is good, regulation is

important. But positivity and transparency are even more important”, explained the CEO of a brickmaker company. The Director General for Environment at the European Commission speaking at the same panel had to react: “Obviously, we also need regulations” – an exchange that made the audience laugh (O#51-2-P).

Box 10. Opening of EBNS 2022

At the 2022 edition, the meeting was opened with a talk by Rob Hopkins, a famous environmental entrepreneur. As presented on its website, “in 2012, he was voted one of the Independent’s top 100 environmentalists and was on Nesta and the Observer’s list of Britain’s 50 New Radicals”⁹⁶. He is also a great performer, who travels the world for speaking at many events, including three TEDx ones, or taking an important role in the famous French environmental movie *Demain*⁹⁷. Presented by the convenor of the conference as someone who allows to “imagine the journey”, his show literally brought the audience – it is his own words – into a “journey into the future”. He started his presentation by explaining the presence of a carton box at his feet. He explained that this box is in fact a “time machine”, which requires, but also allows unlocking “imagination as a transformative force of change”. He asked the audience to close their eyes for three minutes, to imagine themselves transported into the future. The vast majority of spectators, who thus became participants in the performance, played along. The goal was to make our senses work, not only to see but also to feel, touch and hear a desirable future, while imagining the trajectory that will lead us there. After these three minutes, he asked everyone to turn to their neighbour and describe their experience. Most of the audience seemed to be a bit less comfortable with this second exercise. Then came the time to explain to all other participants what kind of experience they had lived during these three minutes, the desirable future they have imagined. Only a few participants spoke out and properly detailed their experience – “I have seen a future of open-ended possibilities”, simply explained a spectator. But this was enough for Rob Hopkins to move on to a new exercise that depicted these open-ended possibilities. He showed pictures – e.g., a bridge in London occupied by the environmental movement Extinction Rebellion where trees have replaced cars – told stories, i.e., a company that gives “nature” a seat on its board – and asked for the reaction it provokes in the audience. These were welcomed and endorsed by the participants, who agreed that this is indeed how things should be. He ended the show promoting his podcasts and books and left the conference which had just started directly afterwards. But his message – the key role of imagination as a positive force of change – had been internalised by the audience, some of whom are future presenters, who did

⁹⁶ Rob Hopkins. “About”. (2023). <https://www.robhopkins.net/about/> (accessed April 5, 2023).

⁹⁷ Ibid.

not hesitate to refer to it in their own presentations – whether it is to apologise for not being “as inspirational as Rob”, as was the case of Anne Larigauderie, Executive Secretary of the IPBES, who was there to depict a situation with regard to biodiversity as viewed by scientists; or to point out that their presentation needs to be attended with the same mindset as Rob’s one: with imagination as a positive and transformative force of change. (O#51-2-P)

Four categories of people are taking the floor at those events: EU officials, business representatives, sustainability initiatives representatives (from, or close to the Natural Capital Coalition), and consultants (endorsed by the Natural Capital Coalition, and often active in the EU@BB platform). As I will come back to these actors in more detail in the article, I just present here some characteristics of two of them that struck me at EBNS 2022. Consultants speaking at those events, just like the 47 years old “disillusioned middle manager” in the above-mentioned comic strip, are sometimes some kind of “repentant former capitalists”. Their personal situation is often fully part of their speech: “I moved from economy to ecology”; “I wanted to make a difference”, explained one of them (O#51-2-P). Business representatives are varied, but all put on an equal footing, whether a CEO of a big multinational (e.g., Roche) or an owner of a small local company (e.g., an artisanal beer) (O#51-2-P). Both have become aware of the value of nature on which their economic model depends. Both face the same problems and challenges in the ecological transition. Both have the same responsibility that they do not hesitate to denounce: “capitalism is violence and individualism”, explained André Hoffmann, Vice Chairman of Roche, the Swiss Pharmaceutical company. More precisely, there would be “good capitalism”, the one that realised the value of nature, and the (temporary) “bad one” that did not (yet) realise it, that is not (yet) at this stage of the journey.



Picture 1. EBNS 2022: Speech of a consultant. Source: Author.

The above picture has been taken during the speech of a consultant owning a company on natural capital advisory projects. Next to her is the European Commission's Director for Biodiversity, convening the session and approving her messages. Like often, the speech was not properly about natural capital accounting. I could not even summarise what it was really about, as it was essentially a series of catchwords and formulas accompanied by images of the wilderness scrolling in the background, with no real connection to her words. She for instance

emphasised the “power of partnerships”, or the “power of investing in nature”. The audience, however, seemed to be won over by the talk which was taking place at the very end of the Summit⁹⁸. “Thank you for inspiring us”; “What an inspiring summit it has been”; “Now, it is time to challenge ourselves” – here are some of the reactions of the audience (O#51-2-P).

These meetings are about shared emotions. The latter are sometimes conveyed by numbers – the percentage of global GDP that is directly dependent on nature, or already lost due to nature loss – “4% loss of GDP; more than the impact of Covid-19” – repeated again and again like a mantra. No discussion, however, engages with how one may come to such a number. As will be further emphasised in the article, discussions are primarily driven by incantations: “We need a GDP-like measurement of biodiversity”, explained the European Commission’s Director for Biodiversity. No one seemed to realise that such a project has existed since the early 1990s, namely the SEEA, the instrument developed in the first world of environmental accounting, which was never mentioned. When they talk on the stage about indicators to be practically used by their audience, they seem to start from scratch.

Measurement tools however do exist, including within this accounting world of natural capital accounting. They are however rarely discussed in substance. The few sessions organised on this issue take place in small rooms (e.g., about 50 seats in 2022), where people stand up because the room is full. There is indeed a demand for such kinds of sessions. In the corridors, I heard people complaining that they do not talk enough about which indicators can be used: “I feel like I’m going in circles”; “They market their stuff very well, but I’m no further ahead” (O#51-2-P). This group of people around my age then discussed what they would say to the company that sent them here. The crowded session on measurement mentioned above led to a number of

⁹⁸ Not all of them share such enthusiasm, as we shall see below.

technical questions on the use of specific informatics programs, or on how carbon capture is counted and achieved through the market in the agricultural sector. As some experts try to provide concrete answers, they are sometimes interrupted by the moderator of the session (from, or close to the Natural Capital Coalition), who moves on to the next question by saying, for example, “this is why those meetings and collaborations are so important” (O#51-2-P).

It is as if nothing should be taken too seriously or should be turned into entertainment. “Practical sessions” are not organised based on the concrete application of standards but based on some sort of role-playing games. The latter are largely oversimplified, engaging for instance the participants in the identification of different types of ecosystems, based on Costanza et al.’s typology (without direct reference to the study), often followed by a personal statement from the game organiser about his or her experience with a particular animal living in this endangered ecosystem. This “biodiversity collage” (see picture below) is described as follows by the organisers: “a collaborative, playful and science-based workshop to better understand biodiversity and the causes and consequences of its loss. This session will bring together small groups of 5 to 7 people to discover what biodiversity is, understand the causes and effects of its decline and come up with ways to better take biodiversity into account in your daily life and company actions” (O#51-2-P). Other examples of such role-playing games will be presented in the article.



Picture 2. EBNS 2022: Biodiversity collage. Source: Author.

Moreover, presence on social media is very important and encouraged during these events. “Produce more quotes that we can post on social media”, urged one of the organisers to the speakers, in reference to one “produced” during the previous day of the conference (see image below). They then ask everyone to retweet the quote, with an associated picture, with the dedicated hashtags #EBNS2022 or #BusinessNatureSummit.



Picture 3. EBNS 2022: Tweets. Source: Screenshots from Author.

EBNS are therefore performances that are not only for the audience attending physically, but also for others outside the Summit. Although there is an element of improvisation, it is also orchestrated, as the article below shows. The orchestration of the performance, including the “spectacularisation” or “staging”, took on a literal meaning on the evening before EBNS 2022, during an award ceremony – the Quarry Life Award – sponsored by the raw material company Heidelberg Materials (O#50-2-D). This event was supported by the natural capital community and the EBNS organisers, but not directly related to it. It was rewarding different projects ranging from biodiversity management, nature-based solutions, or biodiversity education⁹⁹. As shown in the photo below, dancers, in two appearances of about ten minutes each, first choreographed a nature that was being depleted by the installation of a mine, then regained its

⁹⁹ Heidelberg Materials. “Quarry Life Award. Fifth edition of the contest promoting biodiversity. (2023). <https://www.heidelbergmaterials.com/en/quarry-life-award> (accessed April 5, 2023).

rights thanks to restoration projects funded by Heidelberg Materials. Lights changing from white to red to green accompanied this visual spectacle.



Picture 4. Quarry Life Awards 2022: Dancers. Source: Author.

The below article brings some further conceptualisation to the understanding of those events, and, more generally, of the activities of the natural capital community as spectacles or dramatic performances. In accordance with the special issue to which the article belongs, the latter engages with natural capital accounting as a narrative and dramaturgical problem, drawing on research that analyses the spectacularisation of business life as a spectacle. This theoretical framework is presented in the second section of the article. It owes much to the work of Biehl-Missal and its analysis of annual business assemblies as theatrical performances. The aim of

business assembly, she explains, is about visions and orchestrations that “persuasively create a certain reality” (Biehl-Missal, 2011, p. 634). The article not only analyses the Natural Capital Coalition through the concepts provided by the literature on drama in business life, but also uses the metaphor of drama to describe how natural capital accounting is literally performed by the Natural Capital Coalition and its members. It involves a sort of casting, the writing of scripts, the use of the scripts on a stage – virtual or physical –, and the inclusion of the audience as an integral part of the performance. This is how the article is structured.

The first part of the analysis – “the casting” – presents in more detail the key actors and organisations involved in the Natural Capital Coalition’s activities and discusses the role assigned to each of them. It stresses the key role of consultants, a point on which I will come back after the article. The second part of the analysis is about “the script”. The ambiguous role of standards and standardisation processes is outlined here. Although they are called standards, their function is rather that of reports highly staged at their publication. They differ greatly from, for instance, ISO standards, on which I will come back in the discussion of the article. The standards set by the natural capital community are used to be presented at a conference, not to be deployed in practice. Their “setting” has no formal rules. They are sometimes presented to the public early in the process, sometimes not, without really knowing why. The third part of the analysis discusses the performance “on stage”, mostly dedicated to the 2019 EBNS. Finally, the last section of the analysis explores the involvement of the audience. As already suggested, the latter is often viewed as a “co-performer”, for instance through role-playing games. While this article describes a “performance of immobility and recommencement” (Maechler & Boisvert, Forthcoming, p. 22), it has important implications on the way political solutions to the global ecological crisis are thought, discussed, and

(un)developed. This point will be further developed at the end of this sub-chapter, in relation to the concept of “valuation-centrism”.

This is the only article in the thesis that is not yet published but accepted with minor revisions in *Valuation Studies*. As the final revisions are not yet complete, I present here the version resubmitted after the first review. It should also be noted that although I collected all the data, I also made sense of them and developed the conceptual framework through numerous discussions and exchanges with the co-author, Valérie Boisvert. In addition, the conceptual framework has benefited greatly from the advice given in the first review by the editors of the special issue, Fabian Muniesa and José Ossandón.

5.2.3.3 Article 2: Performing Natural Capital Accounting: A Dramaturgical Analysis

Maechler, S., & Boisvert, V. (Forthcoming). Performing Natural Capital Accounting: A Dramaturgical Analysis. *Valuation Studies*, 1–26.

Performing Natural Capital Accounting: A Dramaturgical Analysis

This article was accepted with minor revisions in

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(peer-reviewed journal published by Linköping University Electronic Press)

<https://journal.ep.liu.se/index.php/valuationstudies>

Letter confirming the status of the article

The journal system's considers two types of revisions. Revisions that will "not be subject to a new round of peer reviews" and revisions that will be "subject to a new round of peer reviews". We consider the revisions for this paper in the former category. Even if we don't have the specific category, we could say that the most accurate short description of the status of the paper is "Accept subject to amendments". That is, we expect this paper will be formally accepted once the authors respond to the specific amendments proposed in this round of review.

Hope this message clarifies your concern,

Of course if you have further questions, don't hesitate to contact me again

Best regards

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*** Version re-submitted on 18 February 2022 after the first round of review, then accepted
with minor revision ***

Performing Natural Capital Accounting: A Dramaturgical Analysis

Abstract

Environmental issues are increasingly approached from an economic perspective and considered as natural capital prompt to be valued and accounted for. Natural capital accounting is reported to be a promising tool to align environmental conservation with global capitalism by valuing nature in the same way as economic assets. Both its proponents and detractors argue about what its promises could achieve if they were fully realized, i.e., if nature were actually accounted for and capitalized. Drawing on documents, interviews and ethnographic observations during different events dedicated to natural capital accounting, we suggest that one of the major characteristics of the projects that fall under this heading is their virtualism. Building on research on spectacle and theater in business life, we analyze natural capital accounting as a dramatic performance enacted in four acts: the constitution of a community of actors, the writing and negotiation of scripts, the fiery performance of the project, and the co-creation of experiences with the audience through role-playing games. In this regard, this article contributes to the study of an environmental governance arena as a site of symbolic performance rather than regulatory and ultimately environmental transformations.

Keywords: accounting, environmental governance, performance, spectacle, virtualism

1. Introduction

Value is what leads us to action; it leads to do something, because it means something to us.

(Mark Gough, Director of the Natural Capital Coalition, Korea Value Balancing Alliance conference, 28 October 2020)

The promise of reconciling environmental and business concerns by unpacking the values of nature as capital, promoted here with enthusiasm as an inspiring collective undertaking, has recently gathered momentum. It is currently embodied in “natural capital accounting”, a malleable combination of accounting, statistical, economic and ecological techniques for counting and valuing nature, with the promise of realizing environmental policies. Developed by multiple coalitions and shifting assemblages of actors at the boundaries of the conservation and business worlds, this initiative is being institutionalized. Indeed, the 2019 Green Deal of the European Commission calls for the development of “standardized natural capital accounting practices within the EU and internationally” (EC 2019: 17).

Nature accounting is however not a new program. Projects to integrate the environment into national accounting have been flourishing since the late 1980s (e.g., Ahmad, El Serafy and Lutz 1989; Repetto et al. 1989). They were meant as contributions to the assessment of sustainability, shedding light on the status and progress of countries in this regard and informing public policy. The standard justification for these projects revolves around the concept of externalities and their valuation. Since the values of nature are only partially reflected in the market, the contributions of nature to economic activity, though critical, are overlooked and considerably underrated. Conversely, some damages caused to nature are not accounted for as costs, and therefore cannot be included in decision-making processes. Measuring, valuing and accounting for nature as a natural capital, providing ecosystem services that are essential to economic activity, would enable its accurate recognition (Maechler and Graz 2020a; Stevenson et al. 2021). This representation of the internalization of externalities has been the mainstay of environmental policies for decades (e.g., Pearce, Markandya and Barbier 1989; Stern 2006; Dasgupta 2021), and has been more recently taken up by private actors (TEEB 2010; Natural Capital Coalition 2016). Expressing values in monetary terms allows them to be included in economic calculation and to be taken over, reputedly efficiently, by the market. This would

allow more informed trade-offs between present actions and their future benefits (Maechler and Graz 2020b).

None of the issues facing current natural capital accounting projects for businesses is new. The challenges to be met have long been identified: the practical definition of natural capital; the production of categories, typologies or nomenclatures to capture its constituent assets and the services it provides; the choice and calibration of methods for the physical measurement of these assets and services, and only then their expression in monetary terms (Fredriksen 2017). These issues have all prompted technical debates over several decades among economists, statisticians and accountants on ontological foundations as well as methodological dimensions. As in many other domains, clear – albeit controversial – measurements are viewed as necessary preconditions for action, out of conviction of the economic efficiency of internalization, or simply out of pragmatism (Maechler 2021). Environmental governance has thus long been dominated by the leitmotiv “we don’t protect what we don’t value” (Myers and Reichert 1997). This accounting enterprise has met with much criticism: it is commonly referred to as neo-liberalization or (admittedly incomplete) capitalization or assetization of nature (Levidow 2020; Sullivan 2017).

Both support and criticism relate to what the promises of natural capital accounting could achieve if they were fully realized: if nature were actually “capitalized”, if the standards were largely accepted and applied, in the intended forms and on a meaningful scale and if they actually guided an internalization of corporate environmental externalities. Yet, the objectives of natural capital accounting are defined by vague and hardly binding formulas. The general tenor is to “make nature’s values visible”, to “measure what matters” to “make nature count” and to “mainstream the values of natural capital into decision-making”. Natural capital accounts should “improve the information base for decision-making”, and “help decision-makers recognize the wide range of benefits provided by ecosystems and biodiversity [...] and where appropriate capture these values in decision-making”¹. The language is reassuringly imprecise and do not strictly commit private sector actors to reduce their environmental impacts. Environmental issues are a matter of “invisibility” of values instead of externalities, of “mainstreaming” instead of internalization. Faced with the simplification, theoretical

¹ <http://teebweb.org/>, accessed 5 June 2021. “Making nature’s values visible” is the slogan of the TEEB initiative.

disarmament and depoliticization of the language, it is difficult to see natural capital accounting as a pure economic or technical project.

In our view, one of the major characteristics of current natural capital accounting projects is their virtualism, defined by Carrier and West (2009: 7) as a “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”. In light of the obvious difficulties of realizing natural capital and past experience in this field, we feel it is important to take seriously the fact that the promises made in this context are likely to remain virtual in the long term. “We’ve been hearing the same thing for ten years, but things aren’t really moving forward”, as someone involved in this field since many years reported². Expectations of a commodification or an assetization of nature, although strongly supported by part of the conservation world, are not really materializing. As has been observed in many areas of conservation, nature resists its commodification (Bigger and Robertson 2017; Dempsey and Suarez 2016; Boisvert 2016). There is an enduring disjunction as well between vision and execution in natural capital accounting, and more generally in projects related to the economic valuation of nature (Dempsey 2016; Stevenson et al. 2021; Boisvert, Méral, and Froger 2013).

We suggest that understanding current natural capital accounting projects requires situating them within the public awareness agenda for nature conservation that began in the 1980s and which focuses on the need to communicate the values of nature and natural processes (Randall 1988; Wilson and Peter 1988). We therefore offer to analyze these projects as contributions to the spectacularization of conservation highlighted in the literature on neoliberal natures (Brockington 2008, 2009; Ken MacDonald and Corson 2012; Kenneth MacDonald 2010; Igoe 2017, 2010). This strand of scholarship linking discursive and material productions of nature has shown how nature is mediated and produced through a set of practices, techniques, and imaginaries – how framing nature as “capital” affects its representation and perception. In our case, so-called economic “solutions” to nature’s collapse are produced and made consensual through symbolic realizations, yet with limited regulatory and ultimately environmental outcomes. We argue and set out to show that natural capital accounting is not so much about measuring or producing values, as it is about delivering dramatic performances. Natural capital accounting arenas turn out to be places of “planned, shaped and rehearsed enactment” of a

² Informal talk, European Business and Nature Summit (EBNS 2019), 7-8 November 2019, Madrid, Spain.

dramaturgy (Mangham 1990: 107). We contend that the latter produces effects of its own and pursues objectives that are not strictly conflated with a generalized internalization of environmental externalities or a complete capitalization of nature. We feel that this dimension has been overlooked so far in the critical literature on environmental governance. This is the gap that we intend to address in this paper by exploring natural capital accounting as performance, drawing on research on “business as show business”, and managerial presentations as performances (Biehl-Missal 2011; Clark and Salaman 1996; Mangham and Overington 1987; Lezaun and Muniesa 2017). The aim is in this regard to examine the orchestration of this performance by using the metaphor of a dramaturgy.

After presenting our conceptual framework and materials, we examine the dramaturgy of natural capital accounting in four acts. The first is the casting, i.e., the constitution of a community of actors with specific roles. Secondly, this community undertakes script writing, i.e., rehearsed exercises in standardization and consultations creating group cohesion, concretizing the roles assigned, and preparing the plot for the performance itself. The third act is a fiery celebration of the success of natural capital accounting, which at least symbolically brings the project into existence and thus lends it some reality. Fourthly, a series of role plays and trainings involve the participants as co-performers.

2. Studying environmental governance as a business show

We propose to consider natural capital accounting as an undertaking rather than an outcome, a direction rather than a goal. As we have pointed out, it aims to develop a virtual vision of nature as capital much more than to execute that vision, and thus falls under what Blühdorn (2007: 267–68) calls “politics of simulation” which entails a performance of earnestness, of authenticity, and draws on a form of political communication that “articulates demands which are not supposed to be taken seriously and implemented, but which are nevertheless constantly rearticulated”. It gives rise to an “economy of appearances” (Tsing 2000) in the sense that it implies the production of a spectacle of profitability, success and gain, that aims at dramatizing potential benefits and silencing doubts and critics.

As already mentioned, we believe the research work that analyzes business life as a performance may prove fertile ground for approaching this politics of simulation as a

dramaturgy. Some authors consider that theatrical metaphors are particularly accurate to account for managerial practices, business training techniques, and the staging of certain events that punctuate corporate life. The parallels between the dramaturgies of theater on the one hand and business on the other can be illuminating, as Mangham (1990: 107), drawing on Goffman (1959) points out in referring to the “triadic collusion between author, actor and audience”. Clark and Salaman (Clark and Salaman 1996, 1998b) suggest that charismatic leaders should be seen as “Gurus” in a literal sense. Their analysis stresses the importance of “the presentation of ambitious claims to transform managerial practice, organizational structures and cultures and, crucially, organizational performance, through the recommendation of a fundamental almost magical cure or transformation that rejects the past, and reinvents the organization” (Clark and Salaman 1998b: 137–38). This proposed framing fits well with the ways in which the promises embodied in natural capital accounting projects are sustained.

Inspired by Biehl-Missal (2011) and her analysis of business annual general meetings, we consider that the analogies with theatre go far beyond metaphor. We propose to follow her lead in considering that performance studies can be insightful in capturing what she calls the “performance text”, defined as the “perception occurring through atmospheric, bodily sensations which are influenced by the interplay of aesthetic elements, by the whole behavioural, temporal, and spatial situation”, and that differs from the “linguistic text”, which is the verbal message formally delivered (2011: 622). She thus emphasizes that the events she has studied constitute an “intricate theatrical moment of sound, text, movement, and colours, shared with and co-created by spectators” (2011: 622). Following her path, we propose to consider not only how stories about natural capital valuation and accounting are told, but also how they are orchestrated and performed to impress and persuade. Drawing from research conducted on other environmental negotiations (Death 2011; Fischer and Gottweis 2012; Fletcher 2014), we pay particular attention to the staging and theatricality of events where the accounting of natural capital is debated. The self-appointed “natural capital community” has developed a “meeting culture”(Van Vree 2001): it devotes much of its resources to preparing, organizing and holding meetings, and then debriefing and preparing for the next meeting. In line with the observations of MacDonald and Corson (2012: 159), periods between two official sessions are punctuated by webinars, which conveys the impression of a barely interrupted conversation. In these instances, discursive routines have developed, particular modalities and forms of speaking, ways of being together, of behaving, of addressing each other have gradually been established. Common places have been identified that make it possible to express familiar

concerns in general terms, to deal with divergent interests, and to produce common meanings (Cheyns 2014). We will show the importance in this context of “formulas” and “ideographs”, defined as “an ordinary language term [...] a high order abstraction, representing collective commitment to a particular but equivocal and ill-defined normative goal” (McGee 1980: 15).

The shared vision of what accounting could achieve is articulated through the engagement of the participants in the creation of a common script. Their active commitment is constantly stimulated by facilitation arrangements. They are called upon to become co-performers through play-role games where “reality is produced and conveyed” (Lezaun and Muniesa 2017: 265). The script is then displayed at events of varying size and scope, encapsulated in catchphrases and circulated beyond the arenas where it was created, enlightened by the recollection of the lively experience of the participants. In line with this special issue, our analysis suggests that nature’s valuation through natural capital accounting nature primarily rests on performance texts, made of images, discourses, visions, gestures, but also energy, atmosphere, intangible signs, collective effervescence and ways of being and conveying, which ultimately produce a powerful system of “symbolic manipulation” (Jackall 1988) where “the distinction between what is real and what is not becomes blurred” (Clark and Greatbatch 2004: 389).

This article is based on three types of sources. First, it draws on a review of the relevant literature, ranging across a spectrum of academic articles and gray literature (protocols, featured case studies, methodological reports, standards, declarations), an analysis of outreach documents, including videos and websites. Secondly, it is fed by twelve semi-structured interviews with environmental officers, sustainability managers, economists, and accountants involved in natural capital accounting and nature valuation projects (i.e., people working for businesses, consulting companies, coalitions, conservation organizations). Thirdly, we draw on ethnographic observations conducted between November 2017 and March 2021 within the connected networks and groups of actors presented in the next section. These observations covered fifteen events that lasted from one hour to several days, with the highlights being the Natural Capital Week that took place in Madrid, Spain, from 5 to 8 November 2019 (European Business and Nature Summit), the online We Value Nature 10-days Challenge from 11 to 24 March 2021, and a meeting organized by the International Organization for Standardization in Beirut, Lebanon, from 12 to 15 March 2018 on natural capital valuation standards.

3. A dramaturgical analysis of natural capital accounting

3.1 *The casting*

The primary role in natural capital accounting is played by the Natural Capital Coalition, a broad alliance of public and private organizations set up in 2014 from the network that had been involved in drafting the TEEB for Business and Enterprise report – “The Economics of Ecosystems and Biodiversity” (MacDonald and Corson 2012). This Coalition was founded by the World Business Council for Sustainable Development (WBCSD) and the International Union for Conservation of Nature (IUCN). They are supported by the European Commission, through the “EU Business @ Biodiversity Platform” (EU B@B) created in 2008 “to work with and help businesses integrate natural capital and biodiversity considerations into business practices”³. They succeeded in bringing together around them international conservation organizations such as the United Nations Environment Programme (UNEP) and the World Wide Fund for Nature (WWF), a plethora of consulting firms of various sizes including the Big Four (PwC, Deloitte, KPMG, EY), and big companies – the actual target for such an initiative.

For internal as well as external communication purposes, the participants in natural capital accounting discussions and meetings are commonly referred to as the “natural capital community”, indicating an intention to build a constituency around a common project, to develop ties within the group, and to have its members represent and advocate its collective vision. Broad and flexible, this coalition discloses the attributes of what Clark and Salaman (1998b: 147) call an “imagined community” that they depict as a group whose “members and activities are integrated through [constantly re-manufactured] shared beliefs, mutuality, consensus; where conflict is minimal, the organization is [fictionally] unified and harmonious and members accept the logic of difference and rank and accept their positions and their roles and rewards”. While cultivating togetherness, “the natural capital community” has sufficiently blurred boundaries and socializing mechanism to welcome newcomers. As happily reported by a consultant, “it is open to everyone, we don’t need to pay to follow the event, to participate. It works quite well because everyone feels comfortable”.⁴ In practice, “the community” consists of a collection of people with different positions, backgrounds and roles. Some are employed

³ https://ec.europa.eu/environment/biodiversity/business/about-us/index_en.htm, accessed 6 June 2021.

⁴ Informal talk, EBNS 2019.

by the organizations behind the project and are primarily responsible for its facilitation; others are technical experts in accounting acting as consultants; while still others derive their legitimacy from their proximity to certain regulatory bodies, their experience in the private sector, or their long-standing position as leaders in the field.

Unsurprisingly, the public faces, spokespersons, or “facilitators” of “the community” are employed by the environmental organizations and business-driven coalitions supporting natural capital accounting. Beyond their respective affiliations, they have similar backgrounds: an initial technical degree from a western (in most cases British) university –with a focus on environmental management, environmental science, ecology, or environmental economics, possibly supplemented by additional training (such as a Master of Advanced Studies) in financial management from a prestigious institution (e.g., Oxford University, London School of Economics) to be able to “think like their audience” (i.e., big companies) in order to “transform their consciousness” (Clark and Salaman 1996). They act as masters of ceremony and orchestrate the performance: they ensure that the conditions are met to keep the promises embodied in natural capital accounting alive. They define the talking points and frame the entire discussion, both in terms of content and form, setting the tone and translating complex realities and processes into simple formulas and catchy slogans intended to be taken up. They strive to engage the audience in the debates. They make sure that the meetings are constructive, can always be seen as advances, and do not leave time or space for doubt or criticism to arise, at least not openly. Depending on their level of experience (young people and women are more often entrusted with the facilitation of events, especially when they occur online), they prepare, convene and facilitate internal and outreach events.

The second circle of actors is made up of a large number of consultants, either independent or employed by small specialized consultancies interested in the possible market niche opened by growing expectations of environmental accountability and transparency. Most of them have a technical background in sustainability accounting, some having even been involved in the development of international frameworks for environmental statistics and accounting, such as the United Nations System of Environmental-Economic Accounting (SEEA). Like all consultants, “they have something [they consider] of value to offer” (Clark and Salaman 1998a: 24), and they are therefore often invited to present their methodologies and share their experiences in supporting companies in the process of integrating natural capital into decision-making. In this context, they unreservedly support the project and discuss it as if it were a

common and well-established practice. They describe the definition of standards and procedures as indispensable for dealing with the challenges of the ecological crisis and display all the more seriousness and commitment as their business outline and their future market are at stake. Their credibility and expertise are symbolically involved in their participation in the natural capital community. However, they often do not expect much from it. They generally have few illusions about the chances of disseminating their methodologies, as they readily admit in private. Some of them may lament that the process is not delivering on its promises.

A quite different sort of consultants works for the Big Four accounting and audit firms that have become central to environmental auditing and reporting since the end of the 1990s (Power 1997; Malsch 2013). “They are everywhere (...) they have their hand in the honeypot all the time. They have the money, the expertise and the power”⁵, as reported by a person involved in the setting of standards. Like their peers, they may be involved in “technical” work, including drafting and standards. However, their contribution is sometimes limited to symbolic endorsing documents by putting their company’s name in the list of authors. Their mere presence lends authority and substance to the process. They bring vibrancy and since they participate on a pro bono basis, which is always strongly emphasized, they perform the role of guardians or benevolent patrons watching over the discussions. Their few words drop during meetings are expected and respected, received as omens, which they play up to mark that they are above the fray – like Tom Beagent of PwC during a conference: “I have a vision. I want all companies considering the consequences on society and the environment of every single business decision, underpinned by impact measurement and monetary data”⁶. They multiply signs and gestures that allow them to appear powerful (Biehl-Missal 2010); and to display their political and economic connections (Tsingou 2015) yet without delivering substantial messages.

While the Big Four representatives derive their legitimacy from the identity of their employers, other actors in the theatre of natural capital accounting are considered as reference and authority figures in a personal capacity due to their background. These are the people whose careers typify the revolving door phenomenon, who have accumulated significant symbolic capital in the accounting milieu through their successive or parallel anchoring in the private sector and in the public regulation apparatus, who circulate between the arenas and master their codes and who are considered as insiders. Christian Heller is a good example. After studying business

⁵ Interview: 19 October 2020, online.

⁶ Field notes: Korea Value Balancing Alliance conference, 29 October 2020.

management and ethics, he started his career at the International Integrated Reporting Council (IIRC), an organization specialized in sustainability reporting. He has then been in charge of the sustainability strategy of the chemical company BASF for almost 16 years. In this context, he has been publishing an annual “Integrated Profit and Loss account” for BASF including an assessment of natural capital since 2013 with the support of KPMG⁷. He is a member of the European Union (EU) Sustainable Finance Platform and of the Harvard Business School Impact Weighted Accounts Initiative. He is the CEO of the organization Value Balancing Alliance (VBA) commissioned in 2020 by the European Commission to develop standards for natural capital accounting. His political, economic and epistemic credentials make him an expected and respected speaker in “the natural capital community”. He takes every opportunity to hammer home his message about the importance of making nature’s values fungible in capitalism: “Business’ language is money, we need to feel the environmental impact, so environmental impact needs to be translated into money”⁸; “Money is the language that people share and especially decisionmakers”⁹. His interlocutors take up the message: “We value anyway, this is how the world operate ... we spend our life valuing; but now we need to make it explicit”¹⁰; “Valuing nature is not a debate anymore ... this is a universal imperative”¹¹. His speeches and those of his peers with similar backgrounds are applauded for their clarity, simplicity and appeal. Like an ancient chorus, however, they just repeat, amplify and multiply the natural capital accounting project, without bringing any new argument and without elaborating a narrative, like a counterpoint that underlines the main theme. They have little to contribute beyond the authority derived from their experience and position and therefore do not appear as charismatic leaders or “visionaries” (Harvey 2001).

The latter role is played by Pavan Sukhdev. He is a former Chief economist at Deutsche Bank, and more importantly, the former study leader of TEEB which gave rise to “the natural capital community”. He describes himself as a self-taught environmental economist, driven by environmental convictions that stem from his childhood in India – although he spent most of his schooling between Switzerland and the United Kingdom. While he is now president of

⁷ See the results here : <https://www.basf.com/global/en/who-we-are/sustainability/we-drive-sustainable-solutions/quantifying-sustainability/value-to-society/impact-categories.html>, accessed 21 March 2021.

⁸ Field notes: EBNS 2019.

⁹ Field notes: We Value Nature 10-Day Challenge, session ‘Advancements in our understanding of value’, 24 March 2021.

¹⁰ Field notes: Rob Zochowski, Programme Director at the same conference (We Value Nature 10-Day Challenge).

¹¹ Field notes: Akanksha Khatri, World Economic Forum at the same conference (We Value Nature 10-Day Challenge).

WWF International, he has also launched his own consultancy in natural capital accounting. He was recently awarded the Tyler Prize – “the so-called Nobel prize for environmental achievement” –for contributing to “bringing the economic consequences of environmental degradation and loss to the attention of corporate and political decision-makers”¹². He is rarely present, but he is the true initiator of the project and his name is known and respected by all. He is the voice and face of “the natural capital accounting community”, which he represents and promotes by speaking at popular events such as “TED Talk” (for Technology, Entertainment and Design), which have been shown to be a powerful way of communicating innovative business ideas to a wide audience (Bell, Panayiotou, and Sayers 2019). His performances are reassuringly predictable in terms of both content and audience reaction. They are perfectly staged and executed. He demonstrates the qualities expected from a leader: charisma, vision, energy, rhetorical skills (Clark and Salaman 1996; Harvey 2001), and he masterfully alternates metaphors and incantations about the invisible values of nature¹³. However, he combines conviction and pragmatism. As already noted by MacDonald and Corson (2012: 170), “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”.

Finally, big companies are officially the prime targets of natural capital accounting projects are sending representatives. For them the experience borders on an epiphany, possibly initiating their conversion, as illustrated by this conversation overheard at an event:

- X: I come from the field of insurance; I am totally new to this world.
- Y: Me too; I am in finance.
- X: Ah, that’s even worse than insurance.
- Z: You must have a lot to make up for.¹⁴

Being part of “the community” allows companies “to escape the role of the villain” (Moussu 2019: 61) and feel a sense of belonging to a club of thoughtful leaders, i.e. “an elite community

¹² <https://www.unep.org/news-and-stories/press-release/pavan-sukhdev-wins-2020-tyler-prize-environmental-achievement>, accessed 20 January 2022.

¹³ See the TED Talk of Pavan Sukhdev here: https://www.ted.com/talks/pavan_sukhdev_put_a_value_on_nature?language=en, access 19 January 2022.

¹⁴ Field notes: EBNS 2019.

whose members are motivated by the recognition of their peers and a common goal consistent with the values they consider honorable” (Tsingou 2015: 230–231). While the names of large multinational companies (e.g., Coca-Cola, Holcim, BASF or Kering) are proudly and enthusiastically displayed as a token of broad support for the project, these companies are usually represented by independent consultants. They also sometimes show their support through pre-recorded video messages from executives or even the CEO. When company representatives participate, it is to showcase their “natural capital journey” and highlight their own experience and expertise based on the scenario and stage directions that prevail in the “community”. This is where we turn next.

3.2 *Writing the script and creating visions*

The natural capital accounting script is outlined in a document entitled the Natural Capital Protocol, published in 2016 as the first deliverable of the Natural Capital Coalition. It describes the natural capital accounting journey in four steps: “why, what, how and so what” (Natural Capital Coalition 2016). Strictly speaking, it is not a technical standard, such as those of the International Organization for Standardization (ISO). Rather, it is more what businesses refers to as a “MoU” (memorandum of understanding), described by a member of “the community” as “a very fuzzy framework on which everyone can agree”¹⁵. It does not commit to any particular action as it mainly enjoins people to commit to a consideration of natural capital. Its objective is explicitly of “establishing a common platform for the consideration of natural capital in all sectors” and embodying a “collaborative spirit” (IDEEA Group 2017: 8). This reflects “a form of pseudo-knowledge” (Clark and Greatbatch 2004: 399), which places more emphasis on communicating a vision than on the practical implementation of technical knowledge. The document is full of drawings supposedly representing nature as capital and the services it provides to business. Just as best-selling management books authors publish a new book every few years “to fuel the demand for their services on the corporate lecture circuit” (Clark and Greatbatch 2004: 415), many other documents have followed the Natural Capital Protocol, some focusing on specific sectors: apparel, food and beverage, forest products, as well as two “supplements” for biodiversity and finance.

¹⁵ Interview: UNEP-FI employee. 22 May 2019, Geneva, Switzerland.

These documents are mostly drafted by consultants who may bring their own agenda to the table. However, to be seen as consensual basis of understanding, they officially involve all the members of “the community”. They are usually subject to an open consultation process, so that everyone feels involved. The draft document is first presented during a webinar, then it is posted online and everyone can react or propose amendments. The consultation is followed by a discussion phase which usually drifts quickly on the expected effects of the protocol, the vision it embodies, and does not explicitly address either the nature of the comments or the way they have been incorporated. Each time a new protocol is published, a policy brief follows to emphasize that further progress has been made toward the ultimate goal of achieving conservation through mainstreaming of nature’s values in accounting. What could be called the “backstage” of the performance is part of the performance. In contrast to Goffman’s view, the audience is *not* fully excluded from the script, the performer cannot entirely relax, “drop his front, forgo speaking his lines, and step out of character” (Goffman 1959: 112). Revealing the backstage is intentional: involving the audience in the very design of the project is fundamental to sustain the performance and strengthen the network. The process is at least as important as the result.

Parallel to this process, alternative scripts for natural capital accounting emerged, which threatened to overshadow it, if not compete with it, or even impose alternative performance texts. Indeed, the International Organisation for Standardisation (ISO) has taken up the issue and has set a standard for monetary valuation of nature in 2018 (ISO 14008). Some members of the natural capital community did attend the initial discussions with the agenda to have this standard modelled on their language and script. As reported by ISO experts, they “constantly made proposals to change the text, to bring in the definitions they use in the Natural Capital Protocol [...] it was taking away attention by the market on their things”¹⁶ and therefore they tried “to block everything that they do not initiate by themselves”¹⁷. As they felt their claims would not be sufficiently addressed, they stopped attending meetings. This ISO standard is now published but barely mentioned by members of “the community”. Their strategy for capturing and occupying regulatory space on natural capital accounting is to simply ignore or divert other initiatives. They were able to convince the powerful British Standards Institution (BSI) representing the United Kingdom in ISO (Yates and Murphy 2009) to set a new standard in line

¹⁶ Interview: ISO expert 1. 14 December 2018, online.

¹⁷ Interview: ISO expert 2. 29 January 2019, Baden, Switzerland.

with their own approach and language (BS 8632 Natural Capital Accounting for Organizations, based on the Natural Capital Protocol language).

Many efforts are being made in seemingly distant policy arenas to disseminate key messages on natural capital accounting and standards to a broader audience, so that they eventually become mainstream (Mangham 1995: 495). This implies a proliferation and staging of seemingly competing accounting initiatives and approaches yet stemming from more or less the same network. It conveys the impression of a booming business to provide “the accounting standards of the future” – the motto of the recently created organization Value Balancing Alliance setting standards on behalf of the European Union (EU)¹⁸. It maintains a particular agenda and sense of momentum, brings people together and makes natural capital accounting a dynamic field. More mundanely, it is a way for consultants to get funding. European funding fuels the ongoing various production of methods for valuing and accounting for natural capital and has even allowed a bubble to develop in this regard. Nearly every year a new project is developed, while former ones and their successes and failures are forgotten. This could be interpreted, following Fletcher (2013), as “fetishistic disavowal”, which he defines as a way of dealing with the past by ignoring it, which would lead to reformulate the same proposals over and over again. When they are not simply forgotten, the multiplication of methodological projects has become a pretext to call for yet other types of projects, those that aim at aligning the former. A new project of this kind financed for three years by the EU and entitled “Aligning accounting approaches for nature” has been launched in early 2021. Although the coalitions engaged in natural capital accounting claim to call for methodological convergence and the ordering of what they call the “natural capital soup”, they take advantage of this situation.

This approach does not fully satisfy those who are looking for real transformations of the accounting system, such as participants from the conservation world who hold high positions in their respective organizations and follow these developments – or the absence of development – since a long time. Often trained in environmental or resource economics or environmental sciences, they are well equipped to understand the technicalities of natural capital accounting. Although they support the project in public, they are sometimes skeptical of the way communication takes precedence over technical and practical action to promote standardization.

¹⁸ Field notes: Korea VBA conference 2020.

Ideally the Natural Capital Protocol would have been a standard. Instead, it is just a guideline. Companies can use it as they want. But this is obviously not good enough. People within this coalition are just “conveners”, they are not technical people, they don’t understand the technicality of natural capital.

(Interview, UNEP-FI employee, 22 May 2019, Geneva)

Their goal is simply to make it look like they are making progress on the subject but in reality, they are doing nothing [...they] do not really seek to create a standard but only to attract the attention.

(Interview, IUCN employee, 24 May 2019, Online).

Such criticisms of the lack of concrete progress do not weaken the natural capital script. On the contrary, they are an integral part of it, creating a dramatic tension that rekindles interest and general engagement in the spectacle of natural capital accounting and revives the associated promises in line with what Blühdorn (2007) calls the politics of simulation. Far from defining either clear technical rules or an agenda for action, this script defines themes and registers of expression and opens the way to performance.

3.3 *Performing the script*

The script is brought to life through various meetings. Large events follow a ritualized protocol (Biehl-Missal 2011): an opening and a final plenary session, and sometimes an intermediate plenary session. Yet, no discussion cycle is ever really opened or closed, there are just rituals (“civilized norms”) that punctuate an almost continuous conversation, pursued between meetings by virtual events.

The annual two-day European Business and Nature Summit (EBNS) is probably the key moment of articulation and dissemination of the promise of ensuring environmental conservation through the valuation of nature and its proper visibilization in accounting. Just as in a business general assembly, annual progress is proudly “delivered as an elaborate and spectacular theatrical production” (Biehl-Missal 2011: 620). It takes place since 2014 during the dedicated “natural capital week” in November or December to support the “mainstreaming

of natural capital thinking”. Each year, it is organized in a different European city (the last events were held in Brussels, Paris, The Hague, Frankfurt and Madrid) in a prestigious conference center. The 2019 edition was hosted at the CaixaForum museum, a building designed by the Swiss architects Herzog and de Meuron reinforcing participants’ sense of belonging to a privileged club (Tsingou 2015). In this regard, there was no need to neutralize an impersonal atmosphere through interior staging techniques as it is the generally case for business annual assemblies (Biehl-Missal 2011: 631). The stage was already set for a spectacle that was just waiting to be performed. The main room was actually a theatre. Smaller rooms (three at the 2019 conference) accommodate parallel sessions often organized into roundtables to facilitate communication among participants and reinforce the sense of community. The parallel sessions are chaired by participating organizations, who bring their own style and combine their brand communication and corporate identity with the natural capital accounting language. The name and logo of the organization is displayed on panels on both sides of the room, which are therefore changed from one session to the next. The presenters pitch their business approach to natural capital accounting and showcase their achievements. Then there are interactions with the audience. These are moments of self-promotion whose success as a performance depends on the presence and talent of the presenter but also on the weight of the organization and its relations. Some sessions are relatively deserted, especially since one of the major functions of these large events is the constitution and consolidation of professional networks. Some participants chose not to attend the organized sessions to continue their informal discussions in a social room. Although the script revolves around the notion of natural capital, the usual codes of business meetings prevail. The business and conservation organization participants are not acting; they “perform themselves”, through “non-illusionary real-life presentations “(Biehl-Missal 2011).

Each year, a new motto, often a plain and seemingly commonsense message, is coined or borrowed from a new organization to welcome its creation. As often happens in managerial discourse, these formulas reflect wishful thinking, “what should be the case, not what is the case” (Boltanski and Chiapello 2005: 58). In 2019, it was “the environment underpins everything, business and society”, from the slogan of Business for Nature, a new coalition led by summit organizer Eva Zabey. In 2020, for lack of a new organization to put forward, the convener was an IUCN Programme Officer whose catchphrase was “we’re going to hear

companies on how they put nature at the center of their business model”¹⁹. These messages are then repeated like antiphons or mantras during the sessions, as if saying were doing and as if statements eventually turned into actions if repeated enough (Mangham 1995: 495). These discourses are in addition sustained by risk-oriented imaginaries “that create a strong imperative for urgent action” (Moussu 2019: 60), in an attempt to “transform the consciousness of the audience” (Clark and Salaman 1996).

Business models that are not sustainable will not survive. Business is thus part of the solution, not the problem. To do that, we need to measure the impact of business on nature thanks to natural capital accounting. We need to put in place accounting system that reflect these interactions between business and nature.

(Daniel Calleja, Director General for Environment, European Commission, EBNS 2019, Madrid)

Striving to combine “the rhetoric, persuasive skills, and the sense of ‘drama’ of charismatic leaders” (Biehl-Missal 2011: 620), speakers at plenary sessions repeatedly exhort the audience to action, emphasizing their transformative power, alternating “we” and “you” to emphasize that the participants belong to a community. “We need to move from a competitive to a collaborative world. If we do not collaborate, we will all lose”²⁰; “It will be necessary to convince the 99% of companies that are not in the same direction as you are”²¹. Managers who realized the value of nature as capital are pictured as heroes of our contemporary ecological times (Clark and Salaman 1998b); they have the courage to see the situation as it really is (Lezaun and Muniesa 2017: 267). Critics are disregarded. When a participant voiced concern about the fact that she had been seeing the same faces for years, and that the project was still not progressing, she was reminded that there was still shared enthusiasm, that many standards had been set, and that the level of commitment had steadily increased.

These documents [the Natural Capital Protocol and its supplements] have been based around a language of ‘could’, ‘we could do this, we could do that’, we are now at the next phase. We are moving into ‘should’. But in the future, we must be using ‘must’.

(Mark Gough, Director of the Natural Capital Coalition, Korea VBA conference 2020).

¹⁹ Nadine McCormick, WBCSD, Convener of the 2020 EBNS.

²⁰ Field notes: Willem Ferwerda, CEO & Founder, Commonland, EBNS 2019, Madrid.

²¹ Field notes: Thomas Verheye, EBNS 2019, Madrid.

Photos of the audience, speakers and various moments of interaction are posted on social networks with key formulas of the event as a caption during and after the natural capital accounting meetings, to share the enthusiasm and fervor displayed. All participants are asked to “tweet” or “re-tweet” key moments of the performance through hashtags specifically created for the occasion. These tweets are supposed to attract new participants to the next conference. Regardless of their actual ability to mobilize, they contribute to the performance of success, adding images to words, to give tangibility and reality to the natural capital accounting project.

3.4 Audience as co-performers

Performances are addressed to an audience who plays a critical role in their realization (Goffman 1959; Biehl-Missal 2011; Mangham 1990). The natural capital accounting arenas are marked by an extreme fluidity of these roles. All participants are brought to play them in turn, hence the strong references to “community” which suggests unity over collusion. Therefore, the participants all contribute in an obvious way to the dramaturgy of natural capital accounting.

On the main stage of the 2019 EBNS, interaction was organized through online polls open to the audience. The evasive questions, not inviting specific commitments, are mostly a pretext for the speaker to jump on the participants’ experiences to bring them back to the script (e.g., “if implemented, which policy recommendations would be most likely to convince your CEO to do more on nature”, potential answer ranging from “transforming the financial system”, “agree on ambitious targets for biodiversity”, “publicly support the adoption of an emergency declaration for nature and people”, “integrate and harmonise coherently decisions”). Speakers were also invited to throw an inflatable planet Earth balloon to members of the audience to prompt them to speak up and to share their personal relationship and experience with natural capital.

This is however in smaller rooms that the audience participates most fully in the performance, embarked into a “journey” and various role games during which consultants fulfil the role of “mentor” or “guide”. The collective experience is indeed crucial in the fictional enactment of natural capital accounting projects. “You only need to have a supporting network around

you”²²; “Try not to do this journey alone”²³. The journey metaphor builds on an “epic narrative” developed in three stages according to Clark and Salaman (1998b: 147): “initially the hero (the executive) is complacently unaware of the pressing dangers [i.e., the threats of the ecological crisis on its business model...] secondly, having awakened, the hero in a condition of awareness seeks redemption [i.e., through participation in “the community”]; and finally, in the third stage, the questor achieves transformation through ordeal and commitment” [i.e., by committing to an active participation and undertaking the “journey”].

This journey metaphor is commonly used in sustainability reporting “to symbolize organizational adaptation, learning and advancement” (Rinaldi, Unerman and de Villiers, 2018: 1297). Portraying sustainability transitions as such would “simplify sustainability into something even a layperson or someone new to sustainability could likely understand” (Milne, Kearins, and Walton 2006: 821). Namely, it would convey the notion that the transition is underway as soon as changes are initiated, regardless of whether the intended goals are met. Depicting natural capital accounting in this way highlights its processual nature: companies can progress along this path only in stages, they have to complete an initiatory journey, to undertake a thorough conversion and to witness their experience. “You need to first feel the importance of natural capital for your business model, and only then you can start your natural capital journey”²⁴. “It does not have to be perfect. It is okay not to be perfect. Speak about it and do it!”²⁵. This “invitation to journey” allows for the collection of case studies on natural capital accounting that are published online and discussed during the meetings, not from a substantive point of view, but in their procedural and lived dimensions, with a particular focus on the insights that companies have gained from this experience.

These experiences are discussed in “practical sessions” during meetings and conferences, seen as an opportunity to “force people to think differently and be more creative (boost innovation, not just resilience)”²⁶. They are organized as focus groups that prioritize experience sharing and open communication about the so-called practical barriers to the mainstreaming of natural capital accounting. Participants are challenged to reflect on natural capital through role-playing

²² Jennie Granstorm, H&M Group, EBNS 2020.

²³ Mafalda Pinto, CEO of Scoop, EBNS 2020.

²⁴ A type of sentence successively repeated during the 2019 EBNS.

²⁵ Sue Garfitt, CEO of Alpro, EBNS 2020.

²⁶We Value Nature, Business training on natural capital, <https://wevaluenature.eu/training-resources/module-1>, accessed 21 March 2021.

games strongly inspired by the famous “Harvard Business School Case Method”, aptly described by Lezaun and Muniesa (2017: 271) as “a never-ending experiment”. These exercises enact “strategic scripts” that seek to “initiate certain behaviors” (Clark and Salaman 1998a: 28) and provide an “illusion of reality to satisfy student’s quest for relevance” (Augier and March 2013: 213). They are designed to help them better understand the importance of the environment in risk management. They always rely on the same kind of stories, like a coffee supplier who has to decide where to locate his operations, and who in this case will frame his decision in terms of natural capital that needs to be accounted for²⁷. Participants are required to perform roles that bear no relation to their real-life professional positions. Workshops are also organized around board games adapted for the occasion, such as *Parcheesi*, transformed into *Parcheesi of sustainability*. Players take on the role of corporate sustainability managers who must prioritize objectives and stakeholders based on natural capital assessments. The right choices get them ahead, while the wrong ones, which increase the risk to financial assets, can lead them to bankruptcy. They enable the natural capital community to emerge, consolidate and forge a genuine *valuation culture* (Muniesa 2017: 445). The natural capital accounting project can thus continue. Fiction and reality are intermingled. “The community” has succeeded in imposing its own pace, language and framing on environmental issues.

4. Conclusion

Natural capital accounting is often described in the academic literature, particularly by its critics, as an endeavor to turn nature into capital, with the goal of making tangible and enacting the initially fictitious and abstract category of natural capital. It is widely seen as a further step in the implementation of environmental accounting that has been underway for several decades to support the integration of environmental concerns and sustainability into public policy and more recently private strategies. However, a closer look at its elaboration process leads to nuance in this perception. As we have shown, the negotiation arenas of natural capital accounting are above all the theatre of a post-dramatic performance, in the sense of Biehl-Missal (2010) with presence and lived and felt experience taking precedence over the written text, in this case the declared object of the discussion, i.e., accounting standards.

²⁷For an example, see: https://www.youtube.com/watch?v=Uj-WZk0g4II&feature=emb_logo, accessed 21 March 2021.

In line with this special issue, our analysis suggests that nature valuation through natural capital accounting lies primarily in the performance of texts, images, discourses, visions, collective effervescence and ways of being and conveying. These allow the so-called “natural capital accounting community” to be kept in a state of permanent mobilization, bubbling of activity and incessant agitation, as if the maintenance of this coalition of interests could only be ensured at this price, as if it were absolutely necessary to maintain the illusion of permanent progress in order to maintain the status quo. This is reminiscent of the Red Queen effect, an evolutionary hypothesis – named after Lewis Carol’s character in *Through the Looking Glass*²⁸, which proposes that organisms must constantly evolve, and proliferate simply to survive while pitted against evolving opposing organisms in a changing environment.

The performance of immobility and recommencement we described in this article reflects more generally the managerial turn increasingly evident in the handling of the ecological crisis, that Hibou (2012) describes as a “neoliberal bureaucratization” where practices from businesses and markets are transferred to new domains of social life. We have purposely drawn on a literature that examines the business world as theater to highlight the formal proximities and similarities between corporate managerial habits and environmental governance. Our ambition was to explore the heuristic and analytical power of this literature applied to new objects, and to contribute to the research agenda on global or transnational environmental governance (Paterson and Newell 2010; Andonova 2017). We have shown the capacity of natural capital accounting as performance to generate collective excitement by maintaining the illusion of permanent progress. It would now be interesting to study other sites of environmental governance in the same perspective, including formal and state-led ones, building for instance on the analysis of the post-Paris 2015 climate architecture as an “incantatory system of governance”, where “symbols and narratives appear to be just as important as the production of rules, institutions and instruments” – as recently stressed by Aykut, Morena and Foyer (2021, 521). Faced with the ecological emergency, it seems timely to engage in a systematic deconstruction of the performances of commitment and political voluntarism that result in reformulating again and again the same objectives.

²⁸ In *Through the Looking Glass*, the Red Queen says to Alice: “Now, here, you see, it takes all the running you can do, to keep in the same place. If you want to get somewhere else, you must run at least twice as fast as that!”.

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5.2.3.4 Discussion: The making of immobility

The above article has shown the incantatory character of natural capital accounting as conceived and shaped by the natural capital community, which is, although the term was not used in the article, mainly composed of “meaning entrepreneurs” committed to translating a technical knowledge into simple messages rather than to the concrete technical application of natural capital accounting methodologies and standards. As mentioned in the article, an active member of the Natural Capital Coalition’s advisory board, disillusioned by the lack of progress in this field, reported that “people within this coalition are just ‘conveners’, they are not technical people, they don’t understand the technicality of natural capital” (I#6-2). From this view, standards are instruments to convene. They allow starting a conversation. They are a new step in a never-ending “journey”.

Would the proper implementation of a standard, being by others, end this conversation and complete the journey? What is certain is that the Natural Capital Coalition does not want others to get involved. As briefly mentioned in the article, the Natural Capital Coalition initially tried to control the ISO standard-setting process for monetary valuation and cost and benefit analyses (ISO 14008 and ISO 14007). One of the experts explained that “they [the Natural Capital Coalition] were a little bit concerned that we [ISO] will come up with something that they could not accept because they had this framework [the Natural Capital Protocol] in development” (I#1-2). Yet the Natural Capital Protocol (2016) was published almost at the same time as the standards proposal was accepted within ISO, three years before the first of the two ISO standards was published¹⁰⁰. In addition, the Natural Capital Coalition’s membership also included the historical actors in natural capital accounting, as it was created from the TEEB for

¹⁰⁰ See the chronology of the first of the two standards being published here:

ISO. “ISO 14008:2019 Monetary valuation of environmental impacts and related environmental aspects”. <https://www.iso.org/standard/43243.html> (accessed April 5, 2023).

Business and Enterprise report, and by two powerful conservation organisations, the WBCSD and IUCN. If the Natural Capital Coalition really wanted to spread its standard, it would have been several steps ahead of ISO. But as already put forward in the article, the real matter was not about imposing a standard, but rather about “taking away attention” (I#1-3). A good case in point is that the Natural Capital Coalition still has no formal standard, but different and often unrelated methodologies, “guidelines”, or “approaches” (I#6-2; EI#8-2). The Coalition now proposes, through a new EU-funded project, to “align accounting approaches for nature”¹⁰¹. This episode departs, for instance, from the IPE concept of “regulatory capture”, which considers that “the content of regulation is actively designed by, and in the interests of, the regulated industry itself [...] a situation wherein private sector influence is consistent and systematic [which] leads to the weakening of regulatory standards” (K. L. Young, 2012, pp. 664, 666). In the case of the Natural Capital Coalition, the content of the regulation does not matter, although its influence over natural capital accounting, and, more generally, over biodiversity expertise and politics, is indeed consistent and systematic. All that matters is to occupy the space and capture not the regulations or standards’ content, but the attention. As we shall see below, this allows the Natural Capital Coalition’s discourse and framing on environmental issues, embodied in the valuation of nature (and self-regulations about it), to become obligatory passage points, for example in the way biodiversity expertise is communicated to a wider audience than just experts.

Within the natural capital community, the ISO standards are never mentioned, ignored, as if it was something else, belonging to another “accounting world” (I#6-2; O#30-2-P). Yet, at first sight, ISO experts share a number of similarities with people from the natural capital

¹⁰¹ Capitals Coalition. “Aligning Accounting Approaches for Nature”. (2023). <https://capitalscoalition.org/project/align/> (accessed April 6, 2023).

community. Many of them are consultants or so-called “sustainability professionals”. However, ISO experts were new to the specific domain of natural capital accounting and more used to the traditional environmental management standards of ISO – which are indeed standards, and enforced standards (Corbett & Kirsch, 2001). ISO experts did not seem to know how to use the Natural Capital Protocol precisely because of its undefined status (O#3-2-P). The question of whether it would be strategic to refer to the vocabulary of the Coalition, the one used in the Natural Capital Protocol, has been regularly put on the table. While this vocabulary was seen as a good means of communication, not least because many actors were already accustomed to it, ISO experts found it difficult to translate this vocabulary into concrete technical recommendations and, ultimately, into standardised practices (O#3-2-P), which is nothing but surprising as the Natural Capital Protocol is not intended to be a standard. In the end, ISO experts decided not to follow this path, but “only” to mention the Protocol in the reference list (ISO, 2018).

I once asked during a Q&A at an online event organised by the Natural Capital Coalition whether the ISO standards, which I said I had only recently learned about, could be useful for natural capital accounting – and implicitly showed my surprise that it was never mentioned. The presenter, a consultant close to the Natural Capital Coalition, just told me that they were two completely different things and moved to the next question. This example, also limited to this specific case, shows well how the “natural capital community” tries, and in this case succeeds, in controlling the pace and content of natural capital accounting, sometimes just by doing nothing and remaining silent – including against the most powerful organisation of private standardisation (Yates & Murphy, 2009). It also shows that natural capital accounting, and, more generally, accounting for nature, is a very specific case in relation to standards and standardisation processes. As we shall see in the last sub-chapter, the third accounting world,

that of nature risk accounting, refers to a more traditional view of standards and the competition between the different actors and forms of authority who set them.

Who benefits from this “performance of immobility and recommencement”? It is sure that business firms do not have to disclose their environmental impacts, or just conduct “case studies” that do not commit to anything (e.g., Kering, 2020; Vodafone, 2015). It also probably benefits the primary member of the Natural Capital Coalition, consultants, who are not only involved in conducting these case studies. Consultants make up nearly half of the membership of the Natural Capital Coalition. Only nine (out of 142) are international consultants with offices across continents, including the so-called “Big Four”¹⁰². While the latter pioneered the development of natural capital accounting methods in the 2010s, including in relation to TEEB (KPMG, 2014; PwC, 2015), their current involvement with the Natural Capital Coalition is more of an honorary or patronage role. Their presence is expected, their contributions are received with deference, their comments are taken up, and the placement of their respective logos on reports is believed to serve as a token of credibility. However, they do not actively participate in the facilitation of the platform nor in its technical and methodological content. Their influence is minimal compared to other domains of global environmental governance (Bock, 2014; Bouteligier, 2011; Morena, 2021), let alone of financial governance (Christensen & Seabrooke, 2022; Ramirez, 2012). Training, technical advice, and the production of reports are supplied by the many smaller consultancies, ranging from one to approximately twenty employees. They share and disseminate case studies, presented as success stories through multiple media channels, magnified and labelled at events and meetings. It should moreover be noted that the 142 consulting firms that are part of the Natural Capital Coalition do not reflect

¹⁰² Capitals Coalition. “The Coalition”. (2023). <https://capitalscoalition.org/the-coalition/> (accessed April 6, 2023).

all consultants. Organisations such as WBCSD, IUCN, or UNEP are regularly represented by consultants, as this is also the case of the Natural Capital Coalition, whose employees are sometimes hired for specific missions, and circulate among the different members' organisations of the Coalition. Business firms also use consultants not only for conducting case studies but also for representing them at meetings and conferences. As already mentioned, the European Commission financially contributes to their activities. There is a paradox when it comes to small consultants. While they may regret that natural capital accounting is not widely realised, they also benefit from this immobility.

Although natural capital accounting has never been put into practice, for instance, through standards, its discourse and framing on environmental issues have nevertheless become hegemonic, particularly with regard to the way in which biodiversity expertise is conceived and communicated. This is what the last part of this sub-chapter aims to show.

5.2.4 Frame alignment in international biodiversity expertise

The aim of this section is to show that the discourse and framing of the Natural Capital Coalition on environmental issues goes well beyond its members and regular participants. It has contributed to the production of a dominant evaluation regime for environmental and more specifically biodiversity governance, presented as neutral and scientific, in which power relations are naturalised and which constitutes an unsurpassable reference for environmental policies. I show through two contrasting examples – the Dasgupta Review and IPBES assessments – how the promise of protecting nature by accounting for it, most notably embodied in monetary valuation and natural capital accounting, is being revived and how the language and framing this imposes becomes virtually inescapable even for its opponents. In line with Gibson-Graham's concept of capitalocentrism (2006), I show that nature valuation is obviously

supported by those who explicitly and deliberately support the visions it carries, but that paradoxically perhaps it is also a trap in which its opponents are caught.

5.2.4.1 The Dasgupta Review: “We are all asset managers”

The release of *The Economics of Biodiversity: The Dasgupta Review* in February 2021 and mentioned in the introduction was an important moment in reaffirming the importance of nature valuation, notably through natural capital accounting. This report commissioned by the UK Treasury was to serve an epistemic function for the so-called “2021 ‘super year’ for climate, nature and people”¹⁰³, embodied in the 26th UN Climate Change Conference in Glasgow (COP 26), and the 15th UN Biodiversity Conference, originally scheduled for 2021 in Kunming, China, and rescheduled in December 2022 in Montreal (COP 15).

Dozens of people contributed to the report, although it is named after its coordinator, Partha Dasgupta. The latter is a renowned resource economist who collaborated with David Pearce in the 1990s and already took part in the 2005 MEA. Unsurprisingly, the arguments of the latter are apparent in the text, as also identified by Spash and Hache (2022, p. 666): “[t]he ghost of David Pearce certainly seems present in many of the claims Dasgupta makes about valuation, e.g. subsuming intrinsic values under existence values and so relegating it to a utilitarian concept”. Other well-known figures of environmental expertise contributed, such as Nicholas Stern, mentioned in the first article of my thesis with regard to its use of a discount rate that devalues the future (Maechler & Graz, 2022), and who also produced a landmark report for the UK government with regard to the economics of climate change (Stern, 2006).

¹⁰³ International Institute for Sustainable Development. “The 2021 ‘super year’ for climate, nature and people”. (2023). <https://www.iied.org/collection/2021-super-year-for-climate-nature-people> (accessed April 5, 2023).

In essence, the report asserts and intends to demonstrate that nature is a capital and provides services, until now largely free of charge and therefore unnoticed, but on which humankind critically relies for its survival. “We” are all called upon to realise that through our use of and dependence on nature, “we” are unknowing asset managers. It is time to recognise this reality and to invest in the conservation of ecosystems: “once we make that extension, the economics of biodiversity becomes a study in portfolio management” (Dasgupta, 2021, p. 4). The monetary valuation of nature is presented as an eye-opener, which compels action and makes it impossible and culpable to continue pleading ignorance: “the silence and invisibility of Nature make it utterly vulnerable to our activities” (Dasgupta, 2021, p. 31). Valuing nature as an asset would thus have an unparalleled performativity. The report combines observations on the importance of ecosystems and the limits of GDP, with which it is hard to disagree, with proposals to place the economic valuation of nature at the heart of any conservation project. Consequently, these proposals take on the appearance of obvious common sense, not only to experts, but to everyone and anyone. The novelty of the findings and proposals is overdramatised, as if the economic register were completely new to environmental policies. Past efforts to protect nature are eclipsed. The discourse is forward-looking and explicitly based on economic vocabulary and rationale. It emphasises the unique and historical character of the moment.

The Dasgupta Review briefly mentions the SEEA, the instrument developed in the first accounting world, that of environmental accounting. However, it is only to make the case for the monetary valuation of nature and how GDP should be adjusted to it (Dasgupta, 2021, pp. 310–313), ignoring the contested status of the methodology (O#21-1-D). It is interesting to note that only a few weeks after the publication of the Dasgupta Review, a press conference organised by the UN presented the new version of the SEEA-EA (O#39-2-D). While I have already explained in the previous sub-chapter on environmental accounting how this online

press conference completely overshadowed the debates on monetary valuation, and the fact that only the physical measurement part of the methodology had acquired the status of an international standard, it was also disconcerting to see the similarities between the Dasgupta Review's discourse and that of the speaker at this press conference, Elliott Harris, the UN's Chief Economist. Just as in the Dasgupta Review, sentences started with the first-person of plural to engage the audience in sharing its analysis and agenda and communicate the notion of a common and undifferentiated responsibility (O#39-2-D):

“We need to account for that value”.

“We can no longer rely on GDP alone”

“We will never do something to damage our GDP... so we will begin to think the same way about nature”.

“We will know what is likely to happen to the quality of nature”

“We all know that what we measure, we value, and what we value, we manage”.

Combined with plenty of economic metaphors – “the economy needs a bailout, but so does nature” – and emphasising the uniqueness of the moment – “momentum on valuing ecosystem services is now unstoppable” (O#39-2-D), the speech of Elliott Harris, just as the Dasgupta Review, seemed irrefutable.

To come back to the Dasgupta Review, the messages of the report – with their ambiguities and undertones – were trumpeted by the personalities who spoke at the public launch of the Dasgupta Review: Prince Charles, Prime Minister Boris Johnson, and the famous environmentalist Sir David Attenborough (O#36-2-D). The latter seemed to have fully internalised Dasgupta's message. His speech was punctuated by strong statements about the power of economics and clearly imbued with the belief that economists, rather than ecologists or biologists, are best able to capture the substance of the ecological crisis and its effects, and to produce a conclusive diagnosis and indisputable arguments: “economists understand the

importance of biodiversity better than ecologists do (...) they can help explain it to them with financial portfolios” (O#36-2-D).

These messages were abundantly taken up on social media, most particularly Twitter, under the hashtag #dasguptareview, and relayed within all the networks that perceived it as a decisive support for their action. The Natural Capital Coalition emphasised a “call for the value of nature to be placed at heart of global economics”¹⁰⁴. The Executive Director of UNEP, Inger Andersen, commented: “Nature is our most precious asset. When economists are saying to value it or face ruin, it’s time to listen”¹⁰⁵. The more the press got hold of the subject, the more interviews Partha Dasgupta gave, the more the messages were distorted. One of the most common messages in the media became that “‘Nature is our home’: New UK report urges big economic rethink”¹⁰⁶.

With such messages, the Dasgupta Review has been well received, far beyond the circles that traditionally support the widespread monetary valuation of nature, as noted in an article by Catrin Einhorn in the *New York Times* entitled “They Want to Start Paying Mother Nature for All Her Hard Work”.¹⁰⁷ The article does not offer any explanation or judgment on this broad unanimity, but it does point out, through the use of the indeterminate pronoun “they”, that it is becoming difficult to identify the call for monetary valuation of nature with a specific

¹⁰⁴ Twitter. “Capitals Coalition”. (2021) <https://twitter.com/CapsCoalition/status/1369622031331917826> (accessed April 5, 2023).

¹⁰⁵ Independent. “Nature is our most precious asset. When economists are saying to value it or face ruin, it’s time to listen”. (February 4, 2021). <https://www.independent.co.uk/climate-change/opinion/covid-nature-biodiversity-economy-climate-change-b1796888.html> (accessed April 5, 2023).

¹⁰⁶ Aljazeera. “‘Nature is our home’: New UK report urges big economic rethink”. (February 2, 2021). <https://www.aljazeera.com/economy/2021/2/2/nature-is-our-home-new-uk-report-urges-big-economic-rethink> (accessed April 5, 2023).

¹⁰⁷ New York Times. “They Want to Start Paying Mother Nature for All Her Hard Work”. (February 2, 2021). <https://www.nytimes.com/2021/02/02/climate/dasgupta-report-biodiversity-climate.html> (accessed April 5, 2023).

community. It has spread and been widely taken up by conservationists, or even degrowth advocates. The Twitter account “Research & Degrowth” which represents a group of scholars in Barcelona around Joan Martinez Alier and Giorgios Kallis¹⁰⁸ mentioned in the context of the first accounting world reacted to the report using a fictitious quote – one that I could not find anywhere in the report: “#DasguptaReview on limits to growth: ‘economists should acknowledge that there are in fact limits to growth. As the efficiency with which we make use of Earth’s finite bounty is bounded (by the laws of physics), there is necessarily some maximum sustainable level of gdp’”¹⁰⁹. This highlights the irrefutability of the report and how it is open to various interpretations, especially when circulated in and transformed by the press and social medias.

More generally, the close association between the evidence of ecosystem degradation and the economic solutions put forward by the Dasgupta Review makes it nearly impossible to challenge the latter without being accused of inaction in the face of the former. In the vein of Gibson-Graham’s concept of capitalocentrism, it “deadens the imagination of ‘other worlds’ and shuts down politics” (Healy & Gibson-Graham, 2019, p. 1181). It is particularly challenging, for instance, for the IPBES which coordinates a vast independent international network of experts representing multiple disciplines, to put forward worldviews, cultures, disciplines, and knowledge systems other than those enshrined in this dominant framing.

5.2.4.2 Towards a possible pluralisation of valuation repertoires? IPBES Value Assessment

The IPBES has since its inception in 2012 defended the need to pluralise science by using assessment methods that reflect indigenous peoples’ and local communities’ knowledge and

¹⁰⁸ Research and Degrowth. “Home”. (2023). <https://degrowth.org/> (accessed April 5, 2023).

¹⁰⁹ Twitter. “Research & Degrowth”. (February 6, 2021). https://twitter.com/R_Degrowth/status/1358055681727815682 (accessed April 5, 2023).

worldviews and the many ways of understanding and connecting with nature (Hughes & Vadrot, 2019). The first article of my thesis presented in the conceptual framework chapter (Maechler & Graz, 2022) suggested that it may epitomise a promising way to cope with limits in the substitution of risk for uncertainty. While this article of my thesis focused on how knowledge was produced, another important aspect is how the outcomes of such knowledge production are communicated.

In their recent *Methodological Assessment Report on the Diverse Values and Valuation of Nature*, experts identify 50 possible distinct approaches to valuing nature and its “contributions to people” (IPBES, 2022). They point out that an extremely limited number of these approaches are used with any frequency, confirming, as did the Dasgupta Review before it, that nature assessment has not been widely adopted (IPBES, 2022, p. 22). They, however, stress that instrumental values that can guide green growth and promoted by mainstream economists and natural capital accounting are preferred, while alternative pathways such as Earth stewardship, degrowth, or nature protection are not considered: “Despite the diversity of nature’s values, most policymaking approaches have prioritized a narrow set of values at the expense of both nature and society, as well as future generations, and have often ignored values associated to indigenous peoples and local communities’ worldviews” (IPBES, 2022, p. 3). The experts point out that this consistently reaffirmed focus on monetary and market values could further exacerbate socio-environmental conflicts and prevent the transformative change. They stress that “more equitable and sustainable policy outcomes are more likely to be achieved when decision-making processes recognize and balance the representation of the diverse values of nature and address social and economic power asymmetries among actors” (IPBES 2022, 32). IPBES, whose authority and scientific expertise are increasingly recognised (Charvolin & Ollivier, 2017), is thus a site for the articulation of an alternative agenda, of plural conservation

pathways, emphasising the diversity of values and relationships to nature – not unlike J. K. Gibson-Graham’s diverse economies program (2006).

However, as so often happens when dealing with a dominant paradigm, the IPBES publications also focus on that paradigm, largely in order to expose its limitations. Alternative values and evaluations of nature are presented as “non-economic”, or “non-monetary” and they are compared with their mainstream counterparts (IPBES, 2016), which confirms that the monetary valuation of nature remains the central reference point, if only to criticise or depart from it. The critique itself paradoxically relies on and reinforces the categories and framing it intends to challenge. This relation of other values and other natures to the dominant views and valuations directly recalls the capitalocentrism described by J. K. Gibson-Graham. Indeed, these other forms are “understood primarily with reference to capitalism: as being fundamentally the same as (or modelled upon) capitalism, or as being deficient or substandard imitations; as being opposite to capitalism; as being the complement of capitalism; as existing in capitalism’s space or orbit” (Gibson-Graham, 2006, p. 6).

The centrality and legitimacy of valuation as a framing of discussions on nature conservation are reinforced by the great plasticity and polysemy of this notion, which, as already mentioned in the context of the reception of the Dasgupta Review, is open to various interpretations. In the same way that contemporary capitalism has partly incorporated its critics (Boltanski & Chiapello, 1999), the promoters of natural capital accounting refer to the conclusions of the IPBES assessment – which is totally counter-intuitive given their content – to reassert their position. Although the content of the two reports is substantively different, the reactions to the latest IPBES media release on the diverse values and valuation of nature (IPBES, 2022) have been paradoxically similar to that which hailed the release of the Dasgupta Review. The IPBES’

initial observation that “Political & economic decisions largely ignore nature’s true value”, as tweeted by Inger Andersen¹¹⁰, and the consensus message taken up by the Natural Capital Coalition of “integrating the value of nature across decision-making”¹¹¹, are the only aspects that are commented upon. The simple use of the word “value” in the singular in both cases is however in total contradiction with the spirit of the report and grossly distorts its meaning. In other words, the Natural Capital Coalition and its partner organisations endorsed the report which was then used at the next meeting as a scientific endorsement of their own project, while only emphasising the fact that nature has value, which for its audience means economic value, without ever discussing the substance of the report.

5.2.5 Conclusions on natural capital accounting

The economic valuation of nature embodied into natural capital accounting is presented since the late 1980s as a response to the global ecological crisis. It was first advocated by economists drawing on theoretical arguments that it would allow for the full integration of nature’s values into economic calculations and strategies. Some of its proponents have come to embrace the virtues of monetary valuation for advocacy purposes. The latter see money as a language intelligible to all, which can convey a sense of the importance of nature by showing that it contributes far more to welfare than the economy. The calculation and communication of impressive figures on the value of nature has been considered as (almost) self-sufficient, in the sense that if we know the value of nature, we will protect it, embodied into the motto of “valuing nature to save it”. For the same reasons of alleged instant intelligibility, conservation

¹¹⁰ Twitter. “Inger Andersen”. (July 11, 2022). https://twitter.com/andersen_ingger/status/1546480728787111936 (accessed April 5, 2022).

¹¹¹ Twitter. “Capitals Coalition”. (July 11, 2022). <https://twitter.com/CapsCoalition/status/1546517564976762881> (accessed April 5, 2022).

organisations have relied on monetary valuation in the form of natural capital accounting to enlist business and financial institutions in environmental conservation. In this context, the valuation of nature is emptied of any theoretical content, depoliticised, and deliberately blurred to elicit consensus and support. It appears above all as a pretext for creating and sustaining momentum for biodiversity. This is achieved by minimising differences, erasing diversity and conflict, and repeatedly asserting that all actors, whether ecologists, economists, businesses, consultants, indigenous peoples, or social movements, share a common vision of preserving the values of nature.

The natural capital community is extremely active in social media and saturates the conservation communication space with its slogans. It relays the reports on biodiversity, no matter how different they may be, as so many takeovers of its own message, and thereby subsumes and neutralises dissenting voices. The valuation of nature has probably become a major component of international expertise and discourse on nature conservation because of these multiple orders of justification, arenas and actors that support it. The prevailing feature of conservation discourses is less the promotion of a particular type of value or mode of valuation than the assertion that the recognition of nature's values in general should be central to any successful policy.

While the language and framing of natural capital accounting was deliberately blurred and open to various interpretations, the next accounting world, that of accounting for nature-related risks, focuses on a very specific nature: the one potentially affecting the future profits of investors. Considered as a financial risk in a balance sheet, nature, or what is left of it, can be taken into account in financial investment decisions.

5.3 Accounting for nature-related risks

This last sub-chapter of my analysis discusses the third accounting world, that of accounting for nature related-risks. As we shall see, however, this term is (partly) misleading at the moment, since this world of accounting is mainly focused on climate change only. This is in stark contrast to the two previous accounting worlds which had a much more encompassing notion of nature, whether through a biophysical and energetic understanding of it, or based on ecosystem services and natural capital. Moreover, this accounting world follows a different political objective, which is not oriented towards the reduction of environmental risks, be they only climatic, but towards the management of those environmental risks.

I will first present the theoretical foundations of this accounting world which can be found in the (re)insurance sector. Second, I will explain how the (re)insurance logic of viewing environmental impacts, and more specifically those of climate change, as financial risks to be managed has been extended to all actors and sectors of the financial system. Third, I will introduce the third article of my thesis, and make the argument that the move from the second to the third accounting world equates to a move from mitigating to managing risks, or, in other words, from “impact to risk accounting”. After the article, I will finally discuss the broader political implications of accounting for nature-related risks.

5.3.1 Theoretical foundations: Managing risks

Directly related to the world of finance, accounting for nature-related risks thus transforms nature, but most often only climate change, into a financial risk that can theoretically affect the future profitability of international companies, and thus the financial return of the investors who have invested in them.

The theoretical underpinning of this accounting world is to be found in the (re)insurance industry, which was among the first financial actors to be impacted by climate change (Coleman, 2003; Mills, 2005). As reported by Paterson (2001, p. 21), “[f]rom the very early 1990s, some insurers started to voice concerns about the rise in incidence and severity of payouts resulting from large weather-related catastrophes notably hurricanes and floods”, which could represent “threats to the interests and survival of insurers (and by extension, to large parts of the international financial system)”. The first strategy of insurers was directed toward risk reduction, namely greenhouse gas emissions mitigation, for instance through lobbying or by focusing their activities towards renewable energies (Collier, Elliott, & Lehtonen, 2021; Paterson, 2001). The second strategy is not directed to risk reduction and mitigation, but to risk management: “directly reducing insurers’ exposure by withdrawing cover or increasing requirements” (Paterson, 2001, p. 27). This made economists argue that the impacts of climate change should not be too severe for the insurance industry, “capable of shifting changed risks to the insured, provided that they are properly and timely informed on the consequences of climate change” (Tol, 1998, p. 257).

Faced with a series of severe environmental catastrophes in the 2000s, insurers began to institutionalise such climate change risk management practices through climate risk pricing and the setting of private standards (Thistlethwaite, 2012). Insurers have thus been at the forefront of accounting for nature-related risks, devising new calculations, modelling techniques, and forward-looking scenarios (I. Gray, 2021; N. Taylor, 2022). They have somewhat pragmatically accepted that climate change must be managed if it is not mitigated. While this reasoning was long confined to the (re)insurance sector – the rest of the financial system continued to largely ignore nature, including climate risks –, since the mid-2010s, it has been extended to all or most financial institutions. This entails that since all companies can be affected by climate change,

their investors, who need to be aware of the financial risk of the company they are investing in, should also be aware of climate risks. However, as we shall see in the article and the discussion of it, it is not clear whether this strategy should be understood as a way for the financial system to manage climate risks for itself, or as a way to claim action against the global ecological crisis at low costs.

A leading financial figure has been instrumental in spreading the idea that climate change is a financial risk: Mark Carney. The latter has continually moved between private and public positions, including thirteen years at Goldman Sachs, and then twelve years as governor of the Bank of Canada and, successively, of England. During this central banking period lasting from 2008 to 2020, he was also Chair of the Financial Stability Board (FSB), of the Global Economy Meeting and Economic Consultative Committee of the Bank for International Settlements (BIS), and First-Vice-Chair of the European Systemic Risk Board (ESRB)¹¹². These multiple positions gave him a recognised authority in financial markets. Clarke and Roberts (2016, p. 50) have compiled some of the adjectives used to describe Carney, such as a “rock-star banker” or “the perfect Davos-man”. As we shall see below, through him, and his close association with other leading financial and political figures such as Mike Bloomberg¹¹³, the finance sector started its process of “climatisation”, in the sense that financial actors and institutions have been

¹¹² Credit Suisse. “Mark Carney”. (2021) <https://www.credit-suisse.com/microsites/sustainability-week/iwm/speaker-bios/mark-carney.html> (accessed April 6, 2023). Carney is now and now United Nations special envoy for climate action and finance, as well as vice-chair of the asset management company Brookfield that makes use of new ways to account for climate-related risks.

¹¹³ Mike Bloomberg is a three-term Mayor of New York City, but more importantly the founder of the Bloomberg company, a global leader in financial data services, including recently in financial sustainability analytics, or “ESG”.

Britannica. “Michael Bloomberg. American businessman and politician”. (2023). <https://www.britannica.com/biography/Michael-Bloomberg> (accessed April 7, 2023).

Bloomberg Professional Services. “ESG Data”. (2023). https://www.bloomberg.com/professional/product/esg-data/?utm_medium=Adwords_SEM&utm_source=pdsrch&utm_content=APAC_ESGdata_2023&utm_campaign=728003&tactic=728003&gclid=Cj0KCQjw27mhBhC9ARIsAIFsETFbD8WWkto2ROxCqEJMrSmxej9P7Sci aYQEE_ym3K9QEf-45eGqllUaAgsoEALw_wcB (accessed April 7, 2023).

increasingly framed as relevant to global climate politics (Aykut & Maertens, 2021). Carney was supported by the UN in his project, appointed in 2019 by the Secretary-General as his Special Envoy on Climate Action and Finance for “shifting public and private finance markets and mobilizing private finance to the levels needed to achieve the 1.5°C goal of the Paris Agreement”¹¹⁴. Beside such a mission at the UN, he is also the Chair, and Head of Transition Investing at the asset management firm Brookfield, in charge of “the development of [new financial] products for investors that will combine positive social and environmental outcomes with strong risk-adjusted returns”¹¹⁵.

This is during his time at the Bank of England, and more particularly as Chair of the FSB, that Carney popularised the concept of “climate-related risk”, which was already common-sense in the (re)insurance sector. The speech that made him “the star” of climate finance was delivered at the Lloyd’s of London Insurance and Reinsurance Market (2015), a speech widely recognised as a turning point, notably for its momentum – just before COP 21 in Paris (Aykut, 2020; Christophers, 2017; Thiemann, Büttner, & Kessler, 2023). Entitled “Breaking the tragedy of the horizon – climate change and financial stability”¹¹⁶, the speech explained that “climate-related risks” could result in an unexpected “climate Minsky moment” (Carney, 2018, p. 2) that “even the most advanced models are not able to predict” (Carney, 2015, p. 6). Carney can be seen as a meaning entrepreneur, in the sense that he succeeded in translating a complex idea – the impacts of climate change on the financial system that modelling techniques cannot predict

¹¹⁴ United Nations. “Mr. Mark Joseph Carney of Canada - Special Envoy on Climate Action and Finance”. (2019) <https://www.un.org/sg/en/content/sg/personnel-appointments/2019-12-01/mr-mark-joseph-carney-of-canada-special-envoy-climate-action-and-finance> (accessed April 6, 2023).

¹¹⁵ Brookfield. “Mark Carney”. (2023). <https://www.brookfield.com/about-us/leadership/mark-carney> (accessed April 6, 2023).

¹¹⁶ The speech can be watched here: Youtube. “Bank of England: Breaking the tragedy of the horizon – climate change and financial stability – speech by Mark Carney” (2015). <https://www.youtube.com/watch?v=V5c-eqNxeSQ> (accessed April 6, 2023).

– into a simple idea, or solution: risk disclosure, embodied into “better information to allow investors to take a view” (Carney, 2015, p. 9). Risk disclosure is thus viewed since the very beginning as a means of reducing information asymmetry, which would change the behaviour of financial actors and shift the financial system towards a low-carbon transition. However, we shall see that accounting for nature-related risks does not provide information on the low-carbon transition as such, but, at best, on the risk born by companies and thus investors facing such low-carbon transition. After this speech, a spiral was set in motion as many instruments and institutions were created specifically to manage climate risks, increasingly considered as financial risks.

5.3.2 Institutional developments: A snowball effect

This view that climate change is a financial risk not only for insurers but for the whole financial system has been mainstreamed and institutionalised by Mark Carney himself. In 2015, as Chair of the Financial Stability Board (FSB), he spoke at the COP 21 Climate Change conference in Paris to announce the creation of the Task Force on Climate-related Financial Disclosures (TCFD). The latter, he said, will “develop voluntary, consistent climate-related financial risk disclosures [guidelines] for use by companies in providing information to lenders, insurers, investors and other stakeholders” (FSB, 2015, p. 1). The outcome is a document published two years later containing a series of recommendations for different sorts of actors active in the financial system to include climate-related (financial) risk into their strategies (TCFD, 2017). Supported from the very beginning by the G20 Finance Ministers and Central Bank Governors¹¹⁷, the TCFD, which notes above all that climate risks are insufficiently considered,

¹¹⁷ G20. “Communiqué G20 Finance Ministers and Central Bank Governors Meeting 4-5 September 2015, Ankara, Turkey”. (2015). https://www.g20.org/content/dam/gtwenty/about_g20/previous_summit_documents/2015/Communique-G20-Finance-Ministers-and-Central-Bank-Governors-Meeting-Ankara.pdf (accessed April 6, 2023).

will create a broad movement of reflection among financial actors on how they could integrate climate change as a financial risk into their specific instruments.

While the (re)insurance sector had already embarked on this path of calculating climate risks, even creating dedicated institutions to set the relevant standards (Thistlethwaite, 2012), central banks were the second, with the creation in 2017 of the Network for Greening the Financial System (NGFS). The latter provides guidelines and best practices to national financial stability authorities and central banks of member countries (Thiemann, Büttner, & Kessler, 2022), and a number of central banks started to include climate change into their policies and instruments (Deyris, 2023; Quorning, 2023).

Since things seemed to be moving very quickly, private financial accounting standard-setters came into the picture relatively late, even though accounting is the central instrument of financial capitalism to make risks visible and manageable (Colasse, 2012; Power, 2004). It is only in 2020 that the IFRS Foundation announced its decision to set standards for climate-related risks, publishing a “consultation paper on sustainability reporting” (IFRS Foundation, 2020). This was a few months after the EU announced the beginning of consultations for guidelines on reporting climate-related information¹¹⁸ and a review of the non-financial reporting Directive¹¹⁹, which led in 2021 to a proposal for EU sustainability reporting standards¹²⁰.

¹¹⁸ European Commission. “Targeted consultation on the update of the non-binding guidelines on non-financial reporting”. (2020). https://finance.ec.europa.eu/regulation-and-supervision/consultations/2019-non-financial-reporting-guidelines_en (accessed April 6, 2023).

¹¹⁹ European Commission. “Publication d'informations en matière de durabilité par les entreprises”. (2020). https://ec.europa.eu/info/law/better-regulation/have-your-say/initiatives/12129-Revision-of-Non-Financial-Reporting-Directive/public-consultation_fr (accessed April 6, 2023).

¹²⁰ European Commission. “Reports on development of EU sustainability reporting standards”. (2021). https://finance.ec.europa.eu/publications/reports-development-eu-sustainability-reporting-standards_en (accessed April 6, 2023).

The TCFD, which is closely linked to Carney’s 2015 speech, is thus a turning point for the realisation by financial actors, including financial accounting standard-setters, that climate is a risk that they now must consider. Such importance was clearly put forward by the Head of Enterprise Branch of the United Nations Conference on Trade and Development (UNCTAD), who is also the Chair of the annual UN conference on financial accounting standards (ISAR):

“After the TCFD published its report in 2017, the discussion took a whole new dimension. All things overnight moved towards the area of financial risk dimension – which is a new area of sustainability reporting. The TCFD is already the most important thing that happened to us. Since investors realised that climate is a financial risk, is it an accounting matter”. (I#11-3)

In other words, turning nature into financial risk not only has discursive, but also regulatory consequences, which was not the case when it comes to turning nature into monetary equivalents in relation to natural capital accounting, as will be explained below. Financial analysts are supposed to take this new parameter into their calculations and models. Companies are supposed to disclose and thus account for those risks. However, as will be shown in the article (Maechler 2022), this does not mean that “nature” as such is taken into account, i.e., the common interpretation of it. Financial accounting standard-setters consider that a financial risk should be recognised, and therefore accounted for and disclosed, provided that it is “material”: that it “could reasonably be expected to influence decisions [made by] the primary users of general purpose financial reports” (IASB, 2018, p. 26), primary users being investors (J. J. Young, 2006).

5.3.3 Introduction to Article 3: From impact to risk accounting

The Natural Capital Coalition has recently worked on the links between monetary valuation and the transformation of financial accounting standards in an umpteenth report entitled

“Improving Nature’s Visibility in Financial Accounting” (Capitals Coalition, 2020). The Coalition has also been invited to present its overall project during some financial accounting conferences, such as a side event of the 2019 annual ISAR Conference. A member of IASB – the body of experts that set IFRS standards – explained to me that although these methods were very interesting, they had nothing to do with accounting standards (EI#7-3). This point was confirmed to me a few weeks later by an accountant in a Big Four firm. He explained that financial accounting is not about the price or money as such. It is about the risk, which is then converted into a price (I#9-3). This was the beginning of my engagement with this article, initially a reflection on the dystopia between “real” accounting standards and natural capital accounting propositions. However, new events have taken this research in a somewhat different direction, with the IFRS Foundation and the EU who started to set their above-mentioned sustainability reporting standards.

This article was originally titled “from impact to risk accounting”. One reviewer disagreed with this title because he felt that the IFRS project, while focusing on climate change as a financial risk, was concerned with the *impact* of climate change on company balance sheets. Although I have changed the title, I think that the phrase “from impact to risk” accurately describes the transition from the second, and to a lesser extent even from the first, to the third accounting world.

By impact, I indeed mean mitigation. By risk, I mean management. As with (re)insurers in the 2000s, managing means agreeing not to focus on what can be done to limit climate change but rather to focus on managing the risks that are already there. The second accounting world, that of natural capital accounting, was not always clear between those two objectives. Indeed, the fact that “natural capital impacts and/or dependencies can directly affect business performance”

(Natural Capital Coalition, 2016, p. 15), dependencies meaning risks, was a strong narrative to promote the use of natural capital accounting methodologies. In the same vein, the MEA (2005, p. 9) was already explaining that nature loss also represents “a loss of a capital asset”. More recently, the World Economic Forum calculated that “\$44 trillion of economic value generation – over half the world’s total GDP – is moderately or highly dependent on nature and its services and, as a result, exposed to risks from nature loss”¹²¹, which was a persistent narrative at the last EBNS in October 2022, reinforced by the presence of a WEF employee as a speaker at the Summit (O#51-2-P). The same year as the WEF report, WWF co-published with one of the Big Four firm, PwC, a report entitled “Nature is too big to fail. Biodiversity: the next frontier in financial risk management” (2020), in which they detail the economic and financial implications of biodiversity loss. In those cases, these reports were however written in support of natural capital accounting. The logic of risk, including the publication of high figures, aimed to raise awareness of the need not only to manage these risks, but also, and primarily, to reduce them, particularly through natural capital accounting. The second accounting world, like the first, therefore has the policy objective of mitigating these risks by reducing the impacts – not only of climate change, but also of biodiversity loss and ecosystem degradation. Accounting for nature-related risks is a shift from mitigation to management, or from impact to risk accounting.

The article below thus describes how accounting for nature was thought of and developed in the context of the second accounting world as a mitigation strategy against the global ecological crisis, and how, through “the result of the incremental transformation of environmental issues into meaningful information for investors’ decision-making” (Maechler, 2022, p. 1), financial

¹²¹ World Economic Forum. “Half of World’s GDP Moderately or Highly Dependent on Nature, Says New Report”. (January 19, 2020). <https://www.weforum.org/press/2020/01/half-of-world-s-gdp-moderately-or-highly-dependent-on-nature-says-new-report/> (accessed April 14, 2023).

accounting standard-setters took over the issue. Most of the article is dedicated to the explanation and analysis of how financial accounting standard-setters are including environmental issues into their mandate, and what standards they are setting, taking the case of the IFRS Foundation and of the EU. In the article, the explanation goes beyond Carney's role as a key meaning entrepreneur, focusing also on the importance of so-called "ESG investing" in the early 2010s, which has moved from a strategy to investing "money in a morally acceptable way" (Leins, 2020, p. 72), to a strategy of investing by taking environmental risks into account (Christophers, Bigger, & Johnson, 2020).

Theoretically, this article draws on an interdisciplinary literature on finance and financialisation. Financialisation is reflected by the growing role attributed to, and taken by, financial actors in global environmental, and more specifically climate, governance – I will come back to those twin processes of financialisation and/or climatisation in the conclusion. The article examines how financial accounting expertise is applied to environmental issues, specifically by extending the concept of "financial materiality", which reflects investor-worthy information, to nature and, more specifically, to climate change. I suggest that accounting for nature-related risks put on a pedestal the "needs" of investors, described as more able than others to take anticipatory environmental decisions – which is not unlike Knight's faith in the "gut judgement" of anticipatory entrepreneurs (1921). However, as will be argued, the success of this accounting world in facing the global ecological crisis, and thus reducing environmental impacts, is highly hypothetical: it depends on the promise that low-impact sectors are the same as low-risk sectors, and that investors will indeed follow the information and invest in them. What is certain is that it allows financial actors to claim action on the global ecological crisis without much additional effort. What is less certain, and discussed after the article, is whether this project is really about "nature", and even about accounting.

5.3.4 Article 3: Accounting for Whom? The Financialisation of the Environmental Economic Transition

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Accounting for whom? The financialisation of the environmental economic transition

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ABSTRACT

Accounting standard-setters including the International Financial Reporting Foundation have recently begun to revisit the relationship between accounting and sustainability to address issues of environmental economic transition. How has sustainability become an issue of interest to accounting standard-setters? And how do accounting standards intend to contribute to the environmental economic transition? Scholars of international political economy and cognate fields have devoted little attention to the study of international accounting standards, particularly in relations to sustainability. Drawing on a set of qualitative data and an interdisciplinary literature on finance and financialisation, this article first argues that accounting standard-setters' interest in sustainability is the result of the incremental transformation of environmental issues into meaningful information for investors' decision-making. Secondly, it shows that these standards and their development are based on the premise that the environmental economic transition depends on the provision of information that primarily meets the needs of investors, contrasting starkly with the original underpinnings of sustainability accounting. Overall, both the fact that financial accounting standard-setters are becoming involved in sustainability, and the way that they are addressing this issue, are further evidence of a financialisation of the environmental economic transition.

KEYWORDS

Accounting; environmental transition; financialisation; standards; sustainability

Introduction

On the third day of the 2021 climate change summit in Glasgow (COP 26), which was dedicated to private finance, Mark Carney, former central banker and recently appointed United Nations Special Envoy on Climate Action and Finance, made an ambitious announcement: the mobilisation of US \$130 trillion for global decarbonisation and, more generally, for the transition to a low environmental impact economy. On the same day, another announcement went relatively unnoticed. The International Financial Reporting Standards (IFRS) Foundation that governs international financial accounting standards indicated that it will extend its mandate to sustainability accounting. However, the relationship between accounting and sustainability is not new. Many sustainability accounting initiatives aim to account for social, and especially environmental, impacts of firms that are not captured by financial accounting standards (Thistlethwaite 2011, Thistlethwaite and Paterson 2016). How has sustainability become an issue of interest to accounting standard-

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Sylvain Maechler, PhD thesis

setters? And how do accounting standards intend to contribute to the environmental economic transition?

Despite some long-standing research on financial accounting standards (Perry and Nölke 2006, Donnelly 2007, Leblond 2011, Mügge and Stellinga 2015), and a growing interest in the relationships between the global political economy and sustainability (Clapp and Dauvergne 2011, Jinnah and Morin 2020, Newell 2020, Green *et al.* 2021, Paterson 2021), international political economy and cognate fields have paid limited attention to the role played by international accounting standards when it comes to sustainability. A body of literature has rightly identified the growing consensus among global financial actors such as central banks, institutional investors and insurers, which increasingly see and frame environmental issues as financial risks to be calculated and managed (Bracking 2012, Pattberg 2012, Christophers 2017, 2019, Neville *et al.* 2019, Langley and Morris 2020, Leins 2020, Gabor 2021, Gray 2021, Taylor 2022). But this literature does not explore how international accounting standards echo these developments. A few studies have focused on how a variety of sustainability accounting initiatives have emerged through the authority and expertise of private actors, such as non-governmental organisations, investors, accountants, financial analysts (Lovell and MacKenzie 2012, Hiss 2013, Thistlethwaite 2015, Thistlethwaite and Paterson 2016), but not how international accounting standard-setters have addressed this issue beyond the requirements of their existing set of standards (Thistlethwaite 2011). For its part, accounting studies has a long tradition of examining sustainability issues (for a comprehensive overview of the field, see Bebbington *et al.* 2021). Since the late 1980s, it has been at the forefront of the critique of financial accounting when it comes to the environment and society (Hines 1988, Gray 1990, Maunders and Burritt 1991). It is therefore no surprise that scholars in this field have employed their skills to develop new accounting schemes that account for the environmental (and social) impacts of firms (Bebbington *et al.* 2001, Richard 2012, Gray *et al.* 2014). While accounting scholars have identified the crucial moment related to this expansion of the mandate of international accounting standard-setters – which include not only the IFRS Foundation, but also state-led accounting bodies such as the European Financial Reporting Advisory Group (EFRAG) or the United States Securities and Exchange Commission (US SEC) – there is no consensus in their assessment of the political processes and outcomes underpinning these developments (Abela 2022, Adams and Mueller 2022, Giner and Luque-Vilchez 2022, de Villiers *et al.* 2022).

Drawing on an interdisciplinary literature on finance and financialisation (Epstein 2006, Best 2010, van der Zwan 2014, Christophers 2017, Ortiz 2021), this article argues that this new mandate for accounting standard-setters regarding sustainability is both a result and a driver of the financialisation of the environmental economic transition. More specifically, I first suggest that accounting standard-setters' interest in sustainability is the result of the incremental transformation of environmental issues into meaningful information for investors' decision-making. Secondly, I argue that these standards and their development rely heavily on this assumption that the environmental economic transition requires the provision of information that meets investors' needs. I show how a project driven by the IFRS Foundation contrasts starkly with the long-standing attempts to bring sustainability accounting to a wider audience, beyond investors' needs. The European Union (EU) partly follows this project of accounting beyond investors' needs – although there are, in my opinion, persistent ambiguities and conflicts regarding the audience being targeted. Overall, both the fact that financial accounting standard-setters are becoming involved in sustainability, and the way that they are mainly addressing this issue, are further evidence of a financialisation of the environmental economic transition (Christophers 2017, Gabor 2021).

This article draws on content analysis to extract meaning from diverse communications (Moyser and Wagstaffe 1987, p. 20, Hermann 2008, p. 152). These communications include extensive information gathered through participation in meetings and conferences dedicated to the development, standardisation, promotion and diffusion of these accounting instruments (18 meetings ranging from less than one hour to several days, followed either online or in person between March 2019 and December 2021).¹ Secondly, I draw on 12 semi-structured interviews with environment

officers, sustainability managers, economists and accountants involved in projects of sustainability accounting. Thirdly, data were gathered through the analysis of a corpus of primary sources, including standards, protocols, case-studies, and consultation documents. In addition, a range of secondary accounting sources are used to contextualise and historicise the evolution of sustainability accounting, especially its recent convergence with the traditional users of financial accounting.

The article is structured as follows. Section one reviews the core principles of financial accounting, particularly as they relate to the users of financial accounting statements. Section two describes how sustainability accounting was originally developed in opposition to most of these financial accounting principles, providing information beyond the needs of investors as viewed by accounting standard-setters. The following section is organised around three sub-themes. It (i) examines how environmental issues have been incrementally framed as meaningful information for investors' decision-making; then (ii) describes how the IFRS Foundation has taken on this mandate by focussing on the needs of investors, while the EU and US are developing their own, opposing, projects; and finally (iii) discusses how sustainability accounting standards contribute to a financialisation of the environmental economic transition.

Financial accounting: users as predictive investors

Financial accounting standards are governed by two private organisations. Public companies in the US use the Generally Accepted Accounting Principles (US GAAP) set by the Financial Accounting Standards Board (FASB), to which the US Securities and Exchange Commission (SEC) has delegated such responsibility. Public companies in (currently) 166 other jurisdictions – including the EU – use the International Financial Reporting Standards. The IFRS are set by the International Accounting Standards Board (IASB) whose aim, since the early 2000s, has been to create a single set of global accounting standards to be adopted by countries. The IFRS Foundation is responsible for the governance of the standard-setting process (for example, selecting the board members of the IASB, and now of the newly established International Sustainability Standards Board, the ISSB, which we will come back to later). A lengthy process of 'convergence' means that the standards of US GAAP and the IFRS now share most, but not all, of their core principles (Leblond 2011, Clark 2019).²

The *Statement of Basic Accounting Theory* published in 1966 by the American Accounting Association (AAA) is a seminal, albeit controversial, document that answers the first fundamental question of accounting: *for whom* the information is intended; that is, who are the 'users' of accounting statements (Zeff 1999, Young 2006, Haslam *et al.* 2018). It defines accounting as '[t]he process of identifying, measuring, and communicating economic information to permit informed judgments and decisions by users of the information', and goes on to identify 'equity investors and their representatives [as] the most important of the user groups' (AAA 1966, pp. 1, 23, my emphasis). Although Young (2006, p. 580) points out that '[w]e cannot proceed on the premise that accounting is the monopoly of any one group', he acknowledges that the AAA *Statement* constructed a 'taken-for-grantedness' that investors are the principal users of accounting. This is how the IFRS standards still view users: 'investors, lenders and other creditors – current or potential – who must rely on general purpose financial statements for much of their information needs' (IFRS 2019). Despite some differences, especially related to the visibility of financial market transactions, the US GAAP standards also see investors as the primary users of accounting statements (Clark 2019). This means that from the viewpoint of standard-setters, accounting statements should reflect investors' needs.

While financial accounting users, as well as investors, are diverse and heterogeneous, accounting standard-setters have a precise picture of these actors. Following Young's analysis (2006, pp. 592–5), investors are rational, calculative, predictive, economic beings. The second core question of accounting is consequently *what* information these users need for making economic calculations and predictions. In 1966, the AAA stressed that 'users of financial information reported by a profit-oriented firm are involved in efforts to predict the earnings of the firm for some future

period' (AAA 1966, p. 23). The IFRS standards – more precisely the standard *IAS 1: Presentation of Financial Statements* – still draw on this assumption to require only information related to the 'financial position' of the firm: in other words, information affecting the maintenance of financial capital, that is, the financial risk borne by investors. In accounting terms, the information reported by a firm must be 'financially material'. The concept of 'financial materiality' involves information that 'could reasonably be expected to influence decisions [made by] the primary users of general purpose financial reports' (IASB 2018, p. 26). Yet, the identification of the information that may influence investors' decisions is often viewed as 'a matter of opinion' (Puroila and Mäkelä 2019, p. 1043), or of 'value judgments' (Brown and Dillard 2018, p. 437). As issues other 'than strictly economic ones and/or not influencing the decisions of investors are removed' (Young 2006, pp. 594–5), the materiality of information in accounting, or accounting more generally, plays a part in the construction of the economic reality (Chiapello 2008, Mennicken and Miller 2012). As a result, the provision of information useful to investors and creditors is argued to be in stark contradiction with the requirements of a low environmental impact economy: 'the impact of corporate actions and choices upon [...] the environment, communities and almost anyone or anything other than investors and creditors is likely to be regarded as irrelevant, insignificant, meaningless and inappropriate for inclusion in accounting reports' (Young 2006, p. 597).

The third central issue in contemporary accounting is the time frame over which the information related to maintenance of financial capital is measured. This issue was the subject of a controversial development in the early 2000s, when 'the conceptual underpinnings of the standards move[d] accounting practice away from established concepts of historical cost and stewardship towards concepts of investor decisions based on future cash flows and fair values' (Georgiou and Jack 2011, p. 311). While investors have always been involved 'in the making of forecasts' (AAA 1966, p. 23), assets and liabilities were shown at their acquisition cost from the 1930s until the end of the 1990s (Power 2010, Mügge and Stellinga 2015). With the increasing emphasis on 'shareholder value maximisation' and the shift from production to finance (Boyer 2000, Williams 2000), accounting has been reoriented into the future to better 'meet the needs of passive investors and creditors by reporting fair values derived from current market prices' (Whittington 2008, p. 139). What qualifies as 'fair-value accounting' (FVA), in contrast to 'historical cost accounting' (HCA), is no longer about costs, but about the value of assets and liabilities today according to their ability to provide financial gains in the future. In other words, FVA should offer users, i.e. investors, a better picture of the expected risk of their investments. While such anticipatory calculation was already a common practice in the US, European banks were more resistant to this development, worrying about increased volatility of their assets and liabilities generated by such 'futurity' (Leblond 2011, p. 453). After many negotiations, essentially led by the IFRS (Mügge and Stellinga 2015), FVA has been institutionalised, globalised, 'taken-for-granted and routinised' (Georgiou and Jack 2011, p. 312). While HCA 'offers little room for manipulation as long as original purchase prices or amortised costs are used' (Laux and Leuz 2010, p. 97), the misevaluation of assets and liabilities under FVA has prompted extensive debates in the context of the 2008 financial crisis (Haslam *et al.* 2018).

These future-oriented measurements are intended not only to disclose assets and liabilities at their present value: they should also enable firms to make fair provisions. Provisions represent funds set aside for future expenses. More specifically, according to *IAS 37: Provisions, Contingent Liabilities and Contingent Assets*, 'a provision is a liability of uncertain timing or amount' discounted to its present value, i.e. measured according to FVA, and which 'should act as [a] safeguard' in the face of uncertain events (Laux and Leuz 2010, p. 94). While the global ecological crisis and the related environmental economic transition may be counted as such uncertain events (Maechler and Graz 2022), it has been shown that under current financial accounting standards, there are only rare occasions when environmental values are (or can be) accounted for, e.g. the cleaning of contaminated land (Thistlethwaite 2011). Making environmental issues a meaningful input for investors' decisions would, theoretically, involve considering them as costs to be provisioned. Garcia (2020, p. 230) considers this 'a moderate approach based on the existing framework of accounting',

in contrast to an approach calling for the calculation and internalisation of ‘externalities related to the environment and society’. Indeed, this latter approach marks a break with financial accounting standards in relation to whom the accounting information refers. This is what we turn to now.

Sustainability accounting beyond investors’ needs

The ‘activism/engagement with practice’ of accounting scholars (Bebbington *et al.* 2021, p. 22) has played an important role in devising systems that account for the impacts of firms, well beyond the taken-for-granted needs of traditional users of financial accounting standards. The diffusion of their ideas has been amplified by professional accounting associations (Bebbington *et al.* 2021, p. 7). The literature often takes as the starting point for this, the 1990 report *The Greening of Accountancy*, which asks quite simply ‘how accounting and the accounting profession may set about contributing to the urgent process of environmental protection’ (Gray 1990, p. 19). Written by the accounting scholar Rob Gray on behalf of the Association of Chartered Certified Accountants (ACCA), the report argues that when it comes to the environment, ‘it is obvious the accounting picture is one from which essential elements are missing and, if used as a basis for action and decision, must mislead’ (p. 32).

Since then, accounting scholars have often considered that their research ‘could be mobilised as a way of encouraging organisational change within the capitalist system’ (Adams and Larrinaga-González 2007, p. 334). They have stressed that investors for whom ‘profit is not the only motivator’ do exist (Gray 1990, p. 39), but that they lack information on which to base decisions. The first institutionalisation of sustainability accounting was indeed championed by shareholder activism, which played an instrumental role in the 1997 creation of the Global Reporting Initiative (GRI) – a highly influential institutional development (Brown *et al.* 2009, Dingwerth and Eichinger 2010). For the GRI, the target users of what is measured are not only investors, and are not reduced to predictive economic beings. They are ‘entities or individuals that can reasonably be expected to be significantly affected by the reporting organisation [...] or whose actions can reasonably be expected to affect the ability of the organisation to implement its strategies or achieve its objectives’ (GRI 2016, p. 8) – strategies and objectives that include the ‘[b]roader economic, social, and/or environmental interests ... [of] employees and other workers, shareholders, suppliers, vulnerable groups, local communities, and NGOs or other civil society organizations’ (GRI 2016, pp. 10, 8).

As a set of ‘stakeholders-oriented reporting standards’ (de Villiers *et al.* 2022, p. 2), the GRI thus aims to report on the social and environmental consequences of value creation beyond those experienced by investors. While some have shown that the GRI helps to embed sustainability within companies’ operations (Adams and McNicholas 2007, de Villiers and Maroun 2018), the consideration of stakeholders’ concerns within accounting has also been the subject of criticism. It has been shown, for example, that companies primarily focus on ‘the most powerful stakeholders, mainly investors and shareholders, whose right for information is more formally regulated and unquestioned’ (Puroila and Mäkelä 2019, p. 1061; see also O’Dwyer 2003, Tregidga and Milne 2006). One of the problems lies in the flexibility given to companies in this accounting exercise – the lack of regulation surrounding impact accounting, in contrast to financial accounting. An increasing number of jurisdictions – including the EU through its non-financial Directive 2014/95/EU – require the disclosure of environmental impacts by large companies through the publication of an annual sustainability report. Yet, potential sanctions for not disclosing such information are much weaker than for financial accounting statements (Ioannou and Serafeim 2017), or simply non-existent in the absence of mandatory audit or assurance. Consequently, companies could easily avoid signing up ‘to indicators which were too demanding’ (Milne and Gray 2013, p. 21), especially to indicators that concern the least powerful stakeholders, e.g. civic society (Puroila and Mäkelä 2019).

Another key point is that environmental impacts are not valued in relation to any market price, neither are they made equivalent through a common metric. Rather, they are presented as qualitative and quantitative indicators which, according to Sullivan and Gouldson (2012, p. 60), makes it

impossible for ‘investors to make meaningful comparisons’. Moreover, this means that neither the EU Directive nor the GRI can or do guarantee any form of monetary compensation for these impacts, commonly referred to as the internalisation of social and/or environmental externalities (Maechler and Graz 2020). Translating environmental impacts into monetary equivalents has been partly realised through ‘natural capital accounting’ methodologies developed since the 2010s in the context of the enthusiasm displayed for the economic valuation of nature. With strong support from the European Commission, this way of valuing impacts has been standardised through different natural capital protocols set by a multi-stakeholder initiative (the Natural Capital Coalition), as well as by the International Organization for Standardization (ISO), through its ISO 14008, ‘Monetary valuation of environmental impacts and related environmental aspects’. Various studies have been undertaken that borrow their vocabulary from accounting: ‘environmental profit and loss’ (PwC 2015) or ‘true value’ (KPMG 2014). These studies calculate yearly environmental impacts – both negative and positive – as a monetary figure and compare this with other economic data. This calculation is similar to the income statement in HCA which ‘records realised revenues and how changes and movements in revenues and expenses impact upon the financial position of the firm’ (Haslam *et al.* 2018, p. 301), although it refers to the environmental position of the firm.

However, as Dempsey (2016, 233) has shown, natural capital accounting is ‘at once a totalizing mainstream discourse, and one that exists on the margins of political economic life, on the outside of many flows of goods, commodities, and state policies’. As an IFRS Director of Research in one of the Big Four accounting firms (Deloitte, EY, KPMG, PwC) interviewed in our study notes: ‘you can theoretically monetise everything. But in the absence of a proper standard made by the proper standard-setter, it makes no sense to monetise’.³ The ‘proper standard-setter’ when it comes to accounting information, or what is considered as such due to its structural power on global markets (de Villiers *et al.* 2022, p. 13), is the IFRS Foundation. For a long time, however, the IFRS Foundation showed no interest in sustainability accounting. The reason, one might assume, is that it was commonly accepted that sustainability accounting was geared to the needs of a wider audience than its financial accounting standards. It was the incremental transformation leading to environmental issues being regarded as meaningful information for investors’ decisions that allowed the IFRS Foundation to take up this new mandate for sustainability accounting.

Adapting sustainability to financial accounting users

Making environmental issues ‘meaningful’ for investors

After the 2008 financial crisis, investors were ‘increasingly looking for ways to invest their money in a morally acceptable way’ (Leins 2020, p. 72). This led to the rise of investment strategies that consider environmental, social and governance issues (ESG indicators) when valuing companies’ stocks. A Green Economy advisor from the United Nations Environment Programme Finance Initiative (UNEP-FI), involved in developing strategies for private finance to tackle environmental challenges, describes ESG as an attempt to ensure that environmental issues influence investors’ decisions. Interviewed in our study, this advisor regrets that investors ‘do not believe [yet] that [the environment] has a financial bottom-line in terms of risks’. He continues by adding that ‘if the risk department sees that water or deforestation [as a] risk affects the profitability or increases the costs for the firms that they are financing, it is then possible to reflect these risks into the evaluation of investments [...] natural capital will naturally become material for investors. It will be natural capital accounting in action’.⁴ In short, while he doubts that investors take the full measure of environmental issues as risks to be accounted for, he claims that those risks are already affecting the maintenance of financial capital and should therefore be reflected in or alongside accounting statements, and, by extension, be the object of provisions made by firms.

Since the early 2010s, new sustainability accounting initiatives have partly aligned their framework with this logic, i.e. with the specific needs of investors as viewed by financial accounting

standards. This is reflected in the motto of the US-based Sustainability Accounting Standards Board (SASB): ‘created for the market, by the market’.⁵ In contrast to the spirit of the GRI, stakeholders’ concerns are reduced to those that may have a direct influence on the financial position of the firm, and thus on the decisions of predictive investors. The GRI has, however, proved resistant to these new rival initiatives: in the top 100 companies by revenue, in each of the 52 countries and jurisdictions researched in 2020 by the KPMG Survey of Sustainability Reporting, 67 per cent are still using the GRI Standards (KPMG 2020). During a conference on the topic, a sustainability manager explained this as a phenomenon of path dependency.⁶ In practical terms, the proliferation of sustainability accounting initiatives has made the field even more fragmented than before. The common argument is that the weakness of sustainable finance could be the result of such ‘a patchwork of standards’ (Thistlethwaite 2015, p. 973) or, in other words, a lack of standardisation (Sandberg *et al.* 2009). This assumption has been publicly sustained by newspaper articles such as the *Financial Times* with reference to an ‘alphabet soup’ (Tett 2020). Tarim (2021, p. 6) argues that ‘reporting forms and indices have not culminated in regional or international standards akin to financial and management accounting standards, such as the International Financial Reporting Standards’. The repeated calls for ‘the IFRS Foundation to act to remedy the “complexity” in sustainability standard setting’ (Adams and Abhayawansa 2022, p. 2) prepared the political ground for such involvement, echoing the process that led to the creation of the IFRS Foundation and the IASB in 2001 (Martinez-Diaz 2005). Reviewing the responses to a consultation initiated in September 2020, a member of the IFRS Foundation explained that ‘the message was clear and loud: there are too many sustainability standards, and a lack of comparability and insurability, which may have led to greenwashing’.⁷ Just as for financial accounting, the IFRS Foundation has rapidly claim to provide ‘the global baseline’, or the ‘de facto global language’ for sustainability accounting.⁸ To fall within the mandate of the IFRS Foundation, sustainability accounting must focus on the needs of the users – investors and creditors.

Before the IFRS took up this mandate, there had been a growing trend, since 2015, spreading well beyond private finance, to predict and anticipate so-called ‘climate-related risks’, framed as a threat to global financial stability (Christophers 2017). The Task Force on Climate-related Financial Disclosures (TCFD) created in 2015 by the Financial Stability Board (FSB) has been instrumental in framing environmental issues and more specifically climate change as meaningful information for investors’ decisions. The TCFD published a set of recommendations to financial institutions that officially promote the pricing and disclosure of expected climate-related risks on ‘future assets’ (TCFD 2017, p. 3). In other words, these recommendations should help identify the extent to which a firm has value at risk because of the impacts of climate change, using arguments that are similar to the advocates of FVA in the early 2000s. It was promised that FVA would ‘enhance transparency and improve the quality of information disclosed to investors thereby influencing capital allocation decisions’ (Haslam *et al.* 2018, p. 304). The TCFD stressed that ‘[w]ithout the right information [i.e. so-called climate-related risks], investors and others may incorrectly price or value assets, leading to a misallocation of capital’ (TCFD 2017, p. ii). At the time of writing, the TCFD recommendations have been adopted by 3,100 organisations in 93 jurisdictions.⁹ The success of the TCFD may be explained by the momentum it was able to achieve. It was first proposed in the context of the 2015 United Nations Climate Change Conference (COP 21) in Paris, which emphasised finance-related solutions (Peake and Ekins 2017). The TCFD recommendations published in 2017 engaged a broad movement of market regulators, supervisors and standard-setters, including accounting standard-setters, to develop, each at their own level, the necessary strategies for including climate-related risks in their instruments. In 2019, the TCFD monopolised most of the debates at the annual session of the Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR). Attached to the United Nations Conference on Trade and Development (UNCTAD), this body of experts promotes good practices in accounting and its annual sessions bring the global accounting community together to reflect on the future of accounting. While ISAR – and more generally UNCTAD – are far from powerful bodies when it comes to financial

regulation, these sessions usually give a good overview of topical issues for the future. According to a member of the IASB, the TCFD acted as a ‘game-changer’ for the way that climate issues were seen: now consensually considered as meaningful information for investors, environmental – and more specifically climate – issues, can fall within the IFRS Foundation’s mandate.¹⁰ In the same vein, the Head of Investment and Enterprise at UNCTAD, which convened the conference, explained that ‘the discussion took a whole new dimension [after the launch of the TCFD]. Since investors realised that climate is a financial risk, it is also an accounting matter’.¹¹ While different accounting bodies have recently begun to revisit the relationship between accounting and sustainability to address upfront issues of environmental economic transition, they still differ on whose needs should be represented in accounting statements.

Accounting standard-setters and sustainability: accounting for whom?

The IFRS Foundation published its draft sustainability accounting standards in September 2020 – a consultation document of 22 pages (IFRS Foundation 2020). The enthusiasm with which it was received led to an official announcement at the COP 26 by Erkki Liikanen, Chair of the IFRS Foundation, preceded by a speech from Mark Carney, founder of the TCFD. On the same day, a new International Sustainability Standards Board (ISSB) was officially announced. The ISSB is organisationally designed as equivalent to the IASB, for sustainability rather than strictly financial issues, with the intention that the two bodies of accounting experts should collaborate in order to strengthen the connections between sustainability and financial disclosure. As we shall see below, however, the creation of this new body reflects an ongoing tension between sustainability and financial accounting, which explains why sustainability issues have not been directly included into current IFRS standards. To give the ISSB ‘a running start’, a Technical Readiness Working Group (TRWG) was set up in March 2021. It includes representatives from the IFRS Foundation (which acts as chair), the TCFD, the World Economic Forum (represented by an accountant from Deloitte) and two standard-setting bodies previously in competition with the GRI and its stakeholder-oriented approach: SASB – now merged with the International Integrated Reporting Council to create the Value Reporting Foundation – and the Climate Disclosure Standards Board (CDSB). In 2021 the TRWG published the ‘prototype’ standards, leading to the first two IFRS sustainability standards being published for consultation in March 2022. It is no surprise that they follow the same logic and principles as their financial counterparts in relation to the audience they address: the information disclosed should be ‘useful to the primary users of general purpose financial reporting when they assess enterprise value and decide whether to provide resources to the entity’ (IFRS Foundation 2022a, p. 22). The core focus is thus placed on enterprise value, and only indirectly on environmental impacts (Abela 2022). More specifically, the ISSB project addresses the financial materiality dimensions of environmental impacts, i.e. ‘information most relevant to investors and other market participants’, with the argument that ‘[s]uch information would more closely connect [when it comes to the audience it refers to] with the current focus of the IASB’ (IFRS Foundation 2020, p. 14). The ISSB is therefore widely recognised as an ‘investor-oriented sustainability standard-setting’ (de Villiers *et al.* 2022, p. 2).

Before discussing the specificities of this new set of standards, how it will evolve and be implemented to make private finance contribute to the environmental economic transition, it is important to note that there are those who oppose addressing sustainability accounting primarily through the needs of investors. Unsurprisingly, the GRI, which has long held the leading role in promoting impact accounting, first refused to take part in this project. In March 2022, however, an agreement was reached, with a ‘two pillars logic’: ‘a first pillar representing investor-focused capital market standards of IFRS’, and a second pillar, governed by the GRI, ‘designed to meet multi-stakeholder needs’ (GRI 2022). This may allow the GRI to keep its ‘global position in producing multi-stakeholder standards for sustainability’ (de Villiers *et al.* 2022, p. 1). Nevertheless, the GRI seems to be well aware of the general appeal of sustainability accounting primarily designed for the needs of investors. This may explain why GRI is partnering with another project developed by

a different sustainability accounting standard body: the Corporate Sustainability Reporting Directive (CSRD) of the EU, developed by the European Financial Reporting Advisory Group (EFRAG).

The EU had already declared that ‘the IFRS vision cannot in any reasonable timeline meet European needs’.¹² The EU has supported sustainability accounting beyond investors’ needs for a long time, although without any direct legal intervention beyond referring to existing private sustainability standards through its non-financial reporting directive. The European Commission decided to address the issue head-on, before the official announcement of the IFRS project, in the context of its 2019 Green Deal (European Commission 2019, p. 15). The CSRD was developed by EFRAG, whose mandate was exclusively focused on financial accounting, to represent European interests in international accounting standardisation processes, that is, in the IASB. Again, this reflects the degree to which sustainability has become part of the mandate of traditional accountants, and thus the way in which financial actors and institutions are becoming increasingly involved in a topic they previously neglected (Epstein 2006, p. 3). In 2021, the Commission approved the main principles of the CSRD and supported the creation of a Project Task Force on European Sustainability Reporting Standards within EFRAG to further develop the standards. Giner and Luque-Vílchez (2022, p. 8), two accounting scholars who participated in the drafting of the EU CSRD, point out that the greatest difference with the IFRS project ‘is the intended audience’. According to the project submitted by the Commission to the European Parliament and Council, ‘[t]he primary users of sustainability information disclosed in companies’ annual reports are investors and non-governmental organisations, social partners and other stakeholders’ (European Commission 2021b, p. 2). This approach is also reflected in the double-materiality approach promoted by EFRAG, which should help in ‘removing any ambiguity about the fact that companies should report information necessary to understand how sustainability matters affect them, and information necessary to understand the impact they have on *people and the environment*’ (European Commission 2021b, p. 13, my emphasis). Environmental issues are thus accounted for well beyond their relevance ‘to investors and other market participants’ (IFRS Foundation 2020, p. 14). We will see in the next sub-section that the EU project still has challenges and conventional wisdom to overcome if it is to mark a clear departure from the IFRS project and its investor-driven perspective; how successful it will be in this can only be judged after it has come into force, in 2023 at the earliest.

Finally, the United States remained silent on this issue for a long time, especially during the Trump presidency. However, in May 2021 the Biden administration issued an Executive Order on Climate-Related Financial Risk with explicit reference to the TCFD. As with financial accounting governance (Leblond 2011), the US, more specifically the SEC, intends to develop its own set of standards for sustainability accounting, which should enter into force for the fiscal year 2023. At the time of writing, the SEC seems to be endorsing the spirit of the IFRS Foundation while making no direct reference to it. The SEC proposal under consultation focuses on ‘climate-related risks that are reasonably likely to have a material impact on their business, results of operations, or financial condition’.¹³ As SEC Chair Gary Gensler asserts, this proposal ‘is driven by the needs of investors’.¹⁴ In other words, the US does not follow the EU’s approach, making the EU the only jurisdiction that still (partly) resists sustainability accounting primarily addressed through the needs of investors.

A financialisation of the environmental economic transition

Based on the TCFD, the IFRS Foundation standards account for climate issues only, more specifically the risk a firm is facing due to the impacts of climate change (IFRS Foundation 2022b). The exclusive focus on climate is, at first sight, far from what one would expect from a project officially called ‘sustainability reporting’, and marks a backward step compared to already existing standards such as the GRI. The IFRS Foundation assumes what its consultation document calls a ‘climate-first approach [which] would be able to enlarge its scope in due course’ (IFRS Foundation 2020, p. 12). It is true that the project must start somewhere. Moreover, this approach reflects the centrality of climate change in current environmental governance and sustainable finance debates (Neville *et al.* 2019,

Aykut and Maertens 2021). The overarching issue is *how* the IFRS Foundation intends to account for other environmental issues in the future. As things stand, the Foundation has not proposed any practical or technical strategy on how these standards will evolve going forward. Such a strategy might, for example, cover the costs incurred by companies in identifying and disclosing environmental issues, or ways to address the political priorities of the transition to a low environmental impact economy. The EU project, on the other hand, is not only about climate but also about biodiversity and ecosystems, water and marine resources. In the EU case, too, other environmental issues will be added in future, following a political process which involves recommendations from EFRAG experts (including representatives of the EU, business and civil society), and joint approval by the European Parliament and European Council based on a proposal from the Commission. In the case of the IFRS Foundation, such an expansion of issues will be implemented by the ISSB's experts according to their own interpretation of the needs of their users – as seen above, investors. The Executive Director of the IFRS Foundation has stressed during a public meeting on these sustainability standards that if environmental information 'is flowing into the investor needs, then those elements will hit up'.¹⁵ This puts the IFRS Foundation in a position to define, measure and implement its own vision of the environmental economic transition. The details of that vision will be shaped by the presumed needs of others, that is, investors and their expectations (van der Zwan 2014, Muniesa and Doganova 2020). This also means that this project symbolically dismisses politics, and literally discounts science. As Adams and Mueller (2022) have shown, among the 577 submissions to the IFRS Foundation consultation published online, 39 were identified as being submitted by academics, of which 72 per cent were opposed to the proposals on key issues, including the audience to which sustainability accounting refers. To date, these remarks have been simply ignored by the IFRS Foundation.

Furthermore, while IFRS sustainability standards primarily address investors' needs, investors are viewed as able to address much broader objectives depending on the provision of the right information. As long as the information is properly accounted for and the right price signal is given, then markets will allocate capital in a way that is socially optimal for everyone (Christophers 2017; Ortiz 2021). As a financial analyst suggests with much simplification, the standards and the following disclosure should act 'like Adam Smith's invisible hand working through the account [...] to allocate capital in a way that is aligned with society'.¹⁶ This also means, as pointed out by a member of the IFRS Foundation during a public meeting, that 'expected value creation for investors is [considered as] interdependent with value creation for society and [the] environment'.¹⁷ However, the accounting literature has shown the disconnect between value creation for investor and society (Gray 2006). To pretend otherwise, as supporters of the IFRS sustainability standards do, requires erasing the differences between the diversity of interests involved in the environmental economic transition (Newell 2020).

Although the European CSRD is targeting an audience well beyond investors, some experts involved in the project are making similar assumptions about the concerns of stakeholders and shareholders, as pointed out by an EFRAG business representative during an online conference on this issue:

In terms of stakeholders, we do not really see a difference between financial investors and other stakeholders. So, there is more and more convergence of interest between financial investors and other stakeholders. This is not a conflict but a similar movement [...] We should not work on the assumption that financial investors have different interests than other stakeholder groups. They are quite similar.¹⁸

This assumption is reported to be a source of conflict among EFRAG's members.¹⁹ De Villiers *et al.* (2022, p. 10) indeed stress that the 'the double materiality [promoted by the EU] encloses an ideological conflict between the investors' financial interests and other stakeholders' needs'. As another member of the EFRAG Task Force explained, the starting point for making sustainability accounting contribute to a low environmental impact economy transition is to distance ourselves from the idea that stakeholders – including shareholders themselves – have unified views on sustainability issues

and/or on what should be reflected in account statements.²⁰ However, these important debates only exist within the EU. The US indeed shares the IFRS view and it seems likely that 139 other jurisdictions will apply the IFRS sustainability standards.²¹

It should be noted that, although these projects are developed by financial institutions, none of them actually plan to integrate sustainability information into financial accounting standards. Indeed, it precludes provisions for costs as assumed by IAS 37. Given this situation, we need to ask how investors will react to this new information. This article cannot predict the outcome of this situation, but rather proposes avenues for reflection in relation to the current state of global capitalism. In the age of ‘asset manager capitalism’ (Braun *et al.* 2021), global finance is dominated by so-called ‘passive funds’ (Fichtner *et al.* 2017). The latter have no direct interest in the success or failure of the firms they own, making it difficult to predict how investment flows will react to new information (Braun *et al.* 2021, pp. 284–5). While some investors publicly expect their asset managers to consider climate-related risks in their assessment (Christophers 2019), their concrete role in the transition to a low environmental impact economy is still unclear. Some studies suggest that asset manager funds may well put ‘pressure on corporations to implement genuine long-term strategies that take into account important ESG issues, such as climate change or loss of biodiversity, which most other investors disregard’ (Fichtner and Heemskerk 2020, p. 508). Others stress that passive funds simply ignore environmental concerns (Baines and Hager 2022, p. 14). Would the same apply to information derived from international standards for which the IFRS Foundation is responsible? One thing is clear: the three largest funds (BlackRock, Vanguard Group and State Street) cannot be ignored. They collectively own about 22 per cent of the companies listed on Standard and Poor’s 500 index (Backus *et al.* 2021, p. 291). Moreover, they understand the advantages of a limited and investor-focussed audience to which sustainability issues are addressed. A good case in point is the significant lobbying of the asset managers of BlackRock to undermine the EU project and its emphasis on actors other than investors (Reclaim Finance 2021).

As it stands, sustainability accounting is being developed primarily for the needs of investors and against the public interest. From a different perspective supported by the IFRS Foundation, such a public interest will be properly taken into account by investors depending on their decision-making needs. Another trajectory that sustainability accounting could achieve is not only to consider environmental issues from a broader perspective, but also to act more frontally on profits. As Christophers (2021, pp. 2, 12) pointed out, the nub of investment is profit [...] Unless they think that they will profit, capitalists will not invest [in the environmental economic transition]’. An international tax regime coupled with sustainability accounting may be an interesting way forward. However, such a taxation is currently not on the agenda.

Conclusion

In this article, I first scrutinised the processes by which environmental issues have been transformed into a meaningful input for investors’ decision-making, consequently falling within the mandate of financial accounting standard-setters. From this starting point, I demonstrated that the IFRS Foundation, the international accounting standard-setter, is developing sustainability standards which contrast starkly with the long-standing attempts to ensure that accounting for sustainability reaches a wider audience than only investors. I have also shown that the European project of CSRD remains focus on a broader audience than only investors. However, I have stressed that this project has the hurdle of conventional wisdom to overcome if it is to resist the increasing trend towards a sustainability accounting scheme based on the assumption that the environmental economic transition depends on the provision of information that prioritises investors’ needs. As it stands, both the fact that financial accounting standard-setters are becoming increasingly involved in sustainability, an issue they had previously neglected, and the way that they are addressing this issue, primarily through the needs of investors, provide further evidence of a financialisation of the environmental economic transition.

There is plenty of room for further research. Two possible avenues are outlined here. First, the way that investors and passive funds react to the new information derived from international standards for which the IFRS Foundation is responsible is an important issue. Equally crucial is how firms – ‘the reporting entity’ – will comply with this disclosure framework, which also applies to their ‘subsidiaries’, as proposed by the standards under consultation (IFRS Foundation 2022a, p. 30). This may be all the more important in cases where provisions for costs would have to be made, e.g. if climate-related risks were to be taken seriously and included directly into financial accounting. Even without this, researchers should pay careful attention, as noted by Leaver and Martin (2021), to the boundaries set on firms by socio-legal constructions and accounting processes. Through ‘creative accounting’ practices, firms may syphon off their most climate-risky assets into ‘non-operable joint ventures or affiliates in which they have an equity stake to try to avoid assuming responsibility for the reporting’ (Leaver and Martin 2021, p. 425). In the age of global production networks, characterised by ‘the vertical disintegration of firms and the formation of strategic networks’, this issue is of tremendous importance (Levy and Palpacuer 2017, p. 336).

Secondly, further research could focus on the future transnational governance of sustainability accounting standards, and link this back to the complex bargaining between financial markets, the EU and the US that occurred in the early 2000s regarding financial accounting standards. While for financial accounting ‘the IASB has managed to maintain a delicate balance between American and European interests in devising its standards’ (Leblond 2011, p. 443), the IFRS Foundation is not opening the door to the EU principle of double-materiality and its continued emphasis on impact. Conversely, the EU is sticking to that principle, which it sees as coherent with its explicit ‘global leadership in setting international standards for sustainable finance’ (European Commission 2021a). Rather than being dismissed as a ‘bureaucratic turf war’, this may well reflect fundamentally different views on the role of finance with regard to sustainability, its definition and its achievement.

To conclude, this article contributes to a lengthy and ongoing debate which ranges across political economy, political ecology, ecological economics, economic geography and science and technology studies regarding the extent to which different forms of valuation contribute to the commodification, capitalisation, or financialisation of nature (Büscher and Fletcher 2015, Sullivan 2017, Bracking *et al.* 2020, Levidow 2020). At first glance, sustainability accounting as devised by the IFRS Foundation does not provide a flow of future returns directly from ‘nature’ (Birch and Muniesa 2020); rather, and as shown by others (Robertson 2006, Dempsey and Suarez 2016), such financialisation remains largely incomplete. At this stage of the current projects, this article thus argues for a financialisation of the environmental economic transition, rather than a financialisation of ‘nature’ itself.

Notes

1. These meetings cover all the different projects explored in this article. These include meetings conducted publicly by the IFRS Foundation or the European Financial Reporting Advisory Group to present and discuss their projects, or multi-stakeholder meetings dedicated to discussions on the future of sustainability accounting organised by business organisations, professional accounting organisations or non-governmental organisations.
2. The main difference between the two is that the US GAAP is considered to be ‘rules-based’, while the IFRS is considered ‘principles-based’.
3. Telephone interview: Big Four Executive, Director of IFRS Research (26 November 2019).
4. Interview: Green Economy Advisor at UNEP-FI (22 May 2019, Geneva).
5. Observation: Mardi McBrien, Managing Director, Climate Disclosure Standards Board, 36th session of ISAR (30 October 2019, Geneva).
6. Informal conversation, 36th session of ISAR (1 November 2019, Geneva).
7. Observation: Lucrezia Reichlin, Chair of the IFRS Sustainability Steering Committee. IFRS Foundation (14 December 2021, online). Available: <https://www.ifrs.org/news-and-events/news/2021/12/trwg-recommendations-for-consideration-by-the-issb/> [Accessed 15 December 2021].
8. See: <https://www.ifrs.org/projects/completed-projects/2021/sustainability-reporting/video-erkki-liikanen-introduces-the-issb/> [Accessed 10 December 2021].

9. See: <https://www.fsb-tcdf.org/support-tcdf/> [Accessed 28 March 2021].
10. Informal conversation, 36th session of ISAR (1 November 2019, Geneva).
11. Interview: Head of Investment and Enterprise at UNCTAD (27 November 2019, Geneva).
12. Observation: Thomas Dodd, EU FISMA. European Business and Nature Summit (9 December 2020, online).
13. See: <https://www.sec.gov/news/press-release/2022-46> [Accessed 23 March 2022].
14. Ibid.
15. Observation: Executive Director of the IFRS Foundation. Creating value and managing impact through integrated sustainability disclosure (2 June 2021, online).
16. Observation: Natasha Landell-Mills, Head of Stewardship, Partner, Sarasin & Partners. CDSB conference: Accounting for Climate (5 November 2020, online).
17. Observation: Lucrezia Reichlin, Chair of the IFRS Sustainability Steering Committee. IFRS Foundation webinars on Trustees' sustainability-related work (7 July 2021, online). Available: <https://www.ifrs.org/projects/completed-projects/2021/sustainability-reporting/ifrs-foundation-webinar-on-trustees-sustainability-related-work/> [Accessed 10 August 2021].
18. Observation: EFRAG expert. Creating value and managing impact through integrated sustainability disclosure (2 June 2021, online).
19. Interview: Member of EFRAG's Task Force (19 October 2020, Online).
20. Interview: Member of EFRAG's Task Force (19 October 2020, Online).
21. That is, the 166 jurisdictions already applying the IFRS financial standards minus the 27 EU member states.

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5.3.5 Discussion and conclusions of accounting for nature-related risks

This article, and, more generally, this sub-chapter, has shown how a third accounting world for nature is now emerging, linked to financial capitalism from the perspective of financial accounting standard-setters. First thought of in the field of (re)insurance, then institutionalised mainly through the figure of central banker Mark Carney, and the TCFD, this accounting world proposes that companies disclose aspects of their activity that could have an impact on their economic performance and their stock market value, to ultimately manage some of the impacts of the ecological crisis, and particularly of climate change. The techniques involved are financial accounting techniques above all; ecological, or even broad economic concerns are nowhere to be seen. Nor indeed is nature itself. I have indeed shown that it is not nature that is integrated into this accounting practice and thought, but the potential risks posed by a degraded nature – or a negative environmental image, which is placed on the same level – to companies' bottom line. Nature is not only reduced to a financial materiality analysis. In the IFRS Foundation project, it is also reduced to climate change only, contrasting starkly with the two other accounting worlds. If it is instituted, environmental concerns, primarily climate change, are deemed to be measured, accounted for and managed, despite their being approached from a very selective, restricted angle, i.e., by, and for, investors.

As outlined in the above article, both the IFRS Foundation and the EU projects, although they are developed by traditional financial accounting standard-setters, do not touch on the existing set of financial accounting standards. In other words, financial and “sustainability” information will remain separated, presented through a distinct annual report. The US SEC, briefly mentioned in the article, does not plan a separate report. Climate-related risks will be footnotes in the financial reporting report. Those footnotes should explain that such or such financial figure takes into account the financial materiality of climate risks, the latter being included in a

note to a registrant's audited financial statements" (Securities and Exchange Commission, 2022, p. 40). According to an EU expert, the US SEC treats climate change as "a detail of financial information" (O#53-3-D). But just as in the two other projects, the US SEC does not apply one of the most important principles of financial accounting to sustainability, namely provisions. Provision is about putting money aside in case things do not turn out as planned. It can thus be linked to precaution, and thus to the recognition of the uncertainty of the future (Stirling, 2017). This recognition of uncertainty, although accepted for "traditional" financial reporting, is not yet accepted when it comes to the ecological crisis and the management of its risks.

I have explained that the EU project is somewhat inspired by the second accounting world by proposing to account for environmental impacts, i.e., to mitigate those impacts. However, it shows many ambiguities in relation to this latter world. Conversely, its engagement with the third accounting world, that of nature-related (financial) risks, is evident. Accounting for nature-related risks, most particularly as devised by the IFRS Foundation, seems more likely to succeed than the other accounting worlds, to be truly and globally implemented. This approach is backed by coalitions of private actors, multinational corporations and major accounting firms including the Big Four, who on other subjects, including financial accounting, have demonstrated their ability to impose standards and regulations that align with their interests (Perry & Nölke, 2006; Ramirez, 2012). More importantly, this project promises to allow companies to maintain their existing frame of reference while claiming to be at the forefront of environmental sustainability. It seems to support the idea of a financial sector using "green" innovations to extend the scope of its extractivist ideology (Tordjman, 2021).

While the IFRS project is primarily designed by financial accountants preoccupied with the technical aspects of the standards, as reflected by the composition of the International Sustainability Standards Board (ISSB) that set the standards¹²², the latter ISSB is also chaired by a key figure of the business-sustainability world, in the name of Emmanuel Faber, former CEO of Danone from 2014 to 2021¹²³. His appointment can be seen as a deliberate strategy to blur the lines between the IFRS project and the EU project, and thus with the political objective of mitigating environmental impacts. Indeed, during his time at Danone, he made the company the leading example of sustainability or of “stakeholder capitalism” (linked to “impact mitigation”, thus “risk reduction”), turning the legal status of the company into a *Société à mission*, “a company whose objectives in the social, societal, and environmental fields are aligned with this purpose and set out in its by-laws”, i.e., the 2019 French Pacte law¹²⁴. Its departure from Danone in 2021 caused a great buzz, “A Top CEO Was Ousted After Making His Company More Environmentally Conscious. Now He’s Speaking Out”, titled the *Time*¹²⁵. Through Faber, who is now the face of the IFRS project, but who brought with him the aura of an environmentally conscious businessman, criticisms that the project is only designed by and for investors are perhaps partly internalised.

¹²² IFRS. International Sustainability Standards Board. Members. (2022). <https://www.ifrs.org/groups/international-sustainability-standards-board/#members> (accessed April 7, 2023).

¹²³ IFRS. “Emmanuel Faber. ISSB Chair”. (2022). <https://www.ifrs.org/groups/international-sustainability-standards-board/profiles/emmanuel-faber/> (accessed April 7, 2023).

¹²⁴ Danone. “Raison d’être” Danone. (2023). <https://www.danone.com/about-danone/sustainable-value-creation/danone-societe-a-mission.html> (accessed April 7, 2023).

¹²⁵ Time. “A Top CEO Was Ousted After Making His Company More Environmentally Conscious. Now He’s Speaking Out”. (2021). <https://time.com/6121684/emmanuel-faber-danone-interview/> (accessed April 7, 2023).

5.4 Conclusions of the three accounting worlds

This chapter has examined three accounting worlds for nature that have been developed over the last three or four decades. They coexist today, without really competing, in the sense that they take place in different spaces and involve different types of organisations and actors. They are driven by different higher principles regarding the global ecological crisis and the means to remedy it. As we shall see, however, they are closer than one might think in defining the “nature” they are trying to protect, which for the three accounting worlds is defined from a very utilitarian point of view. The table below proposes to summarise some of the most important points of this chapter, while also going further.

Table 2. Accounting worlds for nature (Source: author)

<u>Accounting worlds for nature</u>	Environmental accounting (1)	Natural capital accounting (2)	Financial accounting for nature-related risks (3)
Date of origin	1980	1990	2015
Main organisation today	UNSD	Natural Capital Coalition	IFRS
Type of actors	Statisticians, national accountants (national and international bureaucrats) <i>Technical entrepreneurs</i>	Consultants, conservation organisations, business representatives <i>Meaning entrepreneurs</i>	Financial markets, Accounting standard-setters <i>Technical and meaning entrepreneurs</i>
Higher principle	Reasoned and fair economic and environmental planning (in response to unequal ecological exchanges); Scientific objectivity <i>Civic world Industrial world</i>	Visibility of nature through money and internalisation of externalities; Conservation celebrities; Spectacularisation of nature <i>Market world World of fame Inspired world</i>	Risk disclosure allows to reorient investments to sectors less exposed to the risks linked to the ecological crisis, which are also considered to be low-impact sectors <i>Market world</i>
Policy objective	Risk mitigation (lowering environmental impacts)	Risk mitigation (lowering environmental impacts)	Risk management (managing environmental impacts)
Nature (definition)	A contribution to economic welfare	A contribution to economic welfare	A parameter for investors' financial return

As in the case of Boltanski and Thévenot's concept of "common worlds" (1991), the three accounting worlds are driven by a set of higher common principles about the global ecological crisis and the means to remedy it, reflected by particular types of expertise and narratives that underpin their respective project. The first accounting world is developed and discussed by national and international bureaucrats with expertise primarily in national accounting and statistics. This reflects well on the one hand, what Godard has coined as "civic nature", in reference to Boltanski and Thévenot's "civic world" based on rules and procedures. "Civic nature" is grounded on "the basic equality of citizens in relation to nature; the latter must be made accessible to the greatest number if it is accessible to some" (Godard, 2004, p. 8, my translation). Statisticians are indeed motivated by making visible unequal ecological exchanges at an international level. They are often preoccupied with more reasoned and fairer economic and environmental planning. This accounting world involves winners and losers. Arbitration must be done by politics, but also by the objectivity of science, on the other hand. In this context, environmental accounting reflects a form of hybrid between the civic, and the industrial world, or what Godard calls "industrial nature", in the sense that action is "based on scientific knowledge and technical ability, and judges are the experts" (Godard, 1990, p. 224, my translation). A good example is the way actors in this world define themselves as the "statistical community", underpinned by the importance of scientific definitions, rules and concepts.

In the second accounting world, that of natural capital accounting and especially in the context of the Natural Capital Coalition, the issue is mainly discussed by private actors, such as businesses and consultants, although highly supported by the conservation world. The aim is to make the largest number of the former realise the values of nature on which their business model critically depends. It is "pragmatic" as those people should not protect nature for anyone

and everyone, but precisely because it is in their own interest. Spash (2009, p. 254), for instance, defined “environmental pragmatism” by quoting the economist Richard Tol (2008, p. 439): “A climate policy that works if people are selfish would also work if people are altruistic”. As long as nature is made visible to all, especially to the market, the latter becomes the arbitrageur by internalising externalities. The solution is thus found in market transaction (Godard, 2004, p. 5). This is very much like Boltanski and Thévenot’s “market world”, driven by the idea of the power of Adams’ Smith invisible hand. We have seen, however, that natural capital accounting also draws on orders of worth coming from different worlds, including for instance the world of fame by enlisting some forms of “conservation celebrities” in their project and putting them on a pedestal, or the inspired world by putting nature and its values into dramaturgical narratives and performances (Maechler & Boisvert, Forthcoming). This flexibility or, depending on one’s point of view, lack of coherence, explains well, I think, the success of natural capital accounting in becoming widely consensual in conservation discourses.

In the third accounting world, that of accounting for nature-related risks, the aim is not to reduce environmental impacts any longer, but to manage the risks, only viewed in their financial dimensions. The higher common principle of this accounting world is that of the well-functioning of financial markets in the absence of asymmetry of information. As I have put forward in the third article of the thesis, “as long as the information is properly accounted for and the right price signal is given then markets will allocate capital in a way that is socially optimal for everyone” (Maechler, 2022, p. 11). This thus entails that depending on the proper disclosure of risks, investments will be reallocated not only to sectors less exposed to the risks linked to the ecological crisis but also to the low-impact ones. An IFRS supporter even referred to Adams Smith’s invisible to support the project, as reported in the article (p. 10). It makes no

doubt that this accounting world refers to the “market world”, or “market nature”. From this view, accounting for nature-related risk is the “purest” of the three worlds.

Despite these differences, all three accounting worlds have an economic and utilitarian definition of nature. To find such a definition, one has to ask “why” a particular accounting method is developed, and not directly “what nature” is accounted for.

In the first accounting world, that of environmental accounting, nature is accounted for because its contribution to GDP remains invisible. It is because nature contributes to economic welfare, which is insufficiently recognised, that environmental accounting methods have been developed. As we shall see, it is very much the same as the second accounting world, that of natural capital accounting. However, it does not then account for the same nature, nor it is translated in the same metrics. Environmental accounting proposes primarily to account for nature as physical units. In the first part of this chapter, I have discussed the resistance of statisticians, described as technical entrepreneurs, to translating this complexity into monetary measures – the latter often being used to make the degradation of nature more “meaningful”.

In the second accounting world, that of natural capital accounting, nature is initially defined as a stock of natural capital consumed by economic activity (Pearce et al., 1989). To be considered, nature needs to be turned into capital and thus valued. Critics of this way of thinking argue, for instance, that bees would “have no value if there are no crops”, as was put forward by a statistician of the first accounting world (O#21-1-D). Indeed, the value of bees is usually defined according to the market value of the crops it has contributed to pollinating. Yet, I have also suggested that natural capital accounting, and monetary valuation of nature, should not be taken at face value. It has internalised its critics, to the point that “non-monetary valuation”

(IPBES, 2016) is often understood in the context of economic valuation. It is interesting to note here that the IPBES published a dedicated report on the issue of pollinators, stressing that:

“Existing studies of the economic value of pollination have not accounted for non-monetary aspects of economies, particularly the assets that form the basis of rural economies, for example human (e.g., employment of beekeepers), social (e.g., beekeepers associations), physical (e.g., honey bee colonies), financial (e.g., honey sales) and natural assets (e.g., wider biodiversity resulting from pollinator-friendly practices). The sum and balance of these assets are the foundation for future development and sustainable rural livelihoods”. (IPBES, 2016, p. 18)

Again, we see here that the IPBES speaks of non-monetary values by speaking of “assets”, which come to reinforce the hegemonic vision of nature as capital to be valued in monetary terms. Again, in the second accounting world, nature is thus most often understood as something that (invisibly) contributes to economic welfare: as an unvalued asset.

In the third accounting world, that of accounting for nature-related risks, nature is defined in an even more restrictive: it is only a parameter for investors’ financial return. Here, I have explained that environmental questions become just a single component in the analysis of materiality within (financial) sustainability reporting, all the more so as nature is often reduced to climate change, in contrast to the other two accounting worlds.

In the end, the three accounting worlds diverge on many points. But they also have commonalities. The first and the second accounting worlds have risk mitigation, i.e., the reduction of environmental impacts, as their main policy objective. They also share a close, if it is not the same, definition of nature. What they do not share is a set of higher common principles. We have seen that some statisticians from the first accounting world working for international organisations have supported the adoption of the language of the second

accounting world, but mainly out of pragmatism, without real conviction. The second and third accounting worlds also share commonalities, e.g., the ability of the market to fix a global problem. They are, however, also much different, notably in their policy objective, and in their definition of nature, which is way more restrictive in the case of the third accounting world. Ultimately, the two worlds that share little or nothing in common are the first and third ones.

Conclusions

This conclusion first discusses three limits of the thesis: 1) Its Eurocentric character; 2) The lack of balance between the different accounting worlds, and thus between the different parts of the analysis; 3) A limited analysis of the circulation of actors and organisations between, and within accounting worlds. I then discuss the five contributions of the thesis as they were presented in the introduction and connect them with the three research questions.

The first limit of this thesis is its Eurocentric focus. In the context of the second accounting world, the Natural Capital Coalition – which has global memberships – has the European Commission as its primary political support. Moreover, its various offices are all located in Europe¹²⁶, while its two founding organisations, IUCN and WBCSD, although they have offices around the world, both headquartered in Switzerland, in the Geneva region¹²⁷, as is one of the key UN partners of the Coalition, UNEP-FI¹²⁸. The annual meeting of the “natural capital community” is itself always taking place in a European city, and therefore brings together mainly (but not only) European actors. Some natural capital accounting projects do exist outside Europe, for instance in Africa, with the so-called “Africa Natural Capital Accounting Community of Practice” that promotes the integration of natural capital accounts on the continent, mainly with the support of the World Bank in the context of its development policies, as well as with the “technical support” of the Natural Capital Coalition and its member consultants¹²⁹. A post-colonial lens could have examined how natural capital accounting was

¹²⁶ Capitals Coalition. “Legal”. (2023). <https://capitalscoalition.org/legal/> (accessed April 8, 2023).

¹²⁷ IUCN. “IUCN Conservation Centre”. (2023). <https://www.iucn.org/about-iucn/iucn-conservation-centre> (accessed April 8, 2023); WBCSD. “How to find us”. (2023). <https://www.wbcsd.org/Overview/About-us/How-to-find-us> (accessed April 8, 2023).

¹²⁸ UNEP-FI. “Contact Us”. (2023). <https://www.unepfi.org/about/contact/> (accessed April 8, 2023).

¹²⁹ United Nations Economic Commission for Africa. “Africa Natural Capital Accounting Community of Practice”. (2023). <https://ecastats.uneca.org/ncacop/> (accessed April 8, 2023).

transposed to such African context, how accounting for nature as capital echoes the post-colonial critique of environmental and more specifically biodiversity governance (Büscher, 2012; Dunlap & Sullivan, 2020), notably when it is brought in the context of international development policies (Ariffin, 2010).

Even in the case of ISO, although the meeting was held in the Middle East region, in Lebanon, most of the experts were from European countries, with the exception of one Lebanese and one New Zealander. Accounting for nature is thus very much developed, and discussed, by Europeans. Although these ISO standards are global in scope and 167 national members represent ISO in their countries, only a very small number have participated in the negotiations of the standards outside Europe. Barriers to entry in the negotiation process is a topic I could have explored. It should be noted, however, that not participating in the negotiations does not exclude the possibility of voting on the standard, which is done online at the end of the process. India's representative organisation in ISO, for example, which did not participate in the negotiations, voted against both standards (ISO 14008 and ISO 14007), which, according to one ISO expert, is always the case with ISO environmental standards, which are always seen as "something exported by the West" and "a trade barrier" (I#1-2). This point again opens up a broad literature on both standards in the Global South (Bartley, 2018), and, more generally, to a Global South perspective on global environmental governance (Held, Roger, & Nag, 2013).

Some events at the UN in Geneva had a global dimension, most particularly in the context of UNCTAD and its Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting (ISAR), involved in the third accounting world, that of accounting for nature-related risks. During this event, I have seen the strong opposition of African states against sustainability reporting standards, which, like India with the ISO standards, they were

seeing as a new obligation imposed on them, a restriction on access to global financial markets. It could have been interesting to analyse more carefully this situation, and how it speaks to other analyses of UNCTAD as “the voice of the Global South” (Golub, 2013). Accounting for nature-related risks is now primarily shaped by IFRS experts, who are chosen according to global geographical repartition. But it remains very Eurocentric, or Western-oriented. The historical headquarters of the IFRS Foundation is in London, and the headquarters for sustainability reporting, although the EU will set its own standards, is in Frankfurt, another major European financial centre. While the ISSB has proposed to establish regional centres around the world, only one has been chosen so far, in Montreal, Canada.

For the first accounting world, the events I followed at the UN in Geneva were organised by the OECD and the UN Economic Commission for Europe (UNECE) and therefore involved European member countries. Moreover, during the meeting of the London Group of Environmental Accounting, all statisticians-experts were European, except one American. Again, I could have questioned this phenomenon. Ultimately, if practical reasons – my location in Europe and my thesis largely based on observations – partly explain this Eurocentric focus, accounting for nature is objectively primarily developed by (and, to a lesser extent, for) European countries, adding, to a lesser extent, the US and Canada. The knowledge I produced in this thesis reinforces this phenomenon. But precisely because accounting for nature could also be imposed on the rest of the world, a global, and possibly “decentred” knowledge of it is also required in the future, to analyse accounting for nature “from both its epicenters and the margins” (Mittelman, 2004, p. 220; see also: Shilliam, 2011; Hobson, 2012).

A second limit of the thesis is the balance between the different accounting worlds, and thus between the different parts of the analysis. The one on natural capital accounting, the second

accounting world, is indeed much longer than the other two. As already mentioned in the methodology, this can be explained by the fact that my research only started with natural capital accounting. It was only during the research process that I became interested in other ways of accounting for nature, notably by going to see how this subject was discussed at the UN in Geneva, exploring, without yet knowing it, what would become my two other accounting worlds and sub-cases.

Furthermore, the third accounting world only really emerged as such when financial accounting standard-setters decided to include environmental issues in their mandate and set their sustainability reporting standards in 2020, so relatively late in my research. Another element that explains the disproportionality of natural capital accounting compared to the others is related to my main data source – observations. As already mentioned, it was easy to go and observe natural capital accounting arenas, to become part of the natural capital community, both online and in person. My participation in the ISO standard-setting process was also a great, yet unexpected opportunity. Thus, this disproportion reflects, on the one hand, my initial decision to focus solely on natural capital accounting and, on the other, my fieldwork opportunities.

While similar observations in the third accounting world would not have been possible in any case, particularly in the context of the IFRS Foundation, which remains largely closed outside of public and essentially promotional meetings, they would have been possible in the first accounting world, that of environmental accounting. Whether at the UN in Geneva or in the London Group of Environmental Accounting, it was easy to be accepted at events and people spoke quite freely, especially in the latter context. I however did not as many observations as for natural capital accounting for two, related, reasons: the time-consuming feature of this data

collection method on the one hand (Gusterson, 2008), and the mere fact that environmental accounting was not really considered as a serious policy option by the actors I have first talked to, which undoubtedly, and regrettably, influenced my decision to focus more on natural capital accounting, yet without completely neglecting environmental accounting. In retrospect, I think there is yet a lot to be said about this accounting world, particularly with regard to the resistance of statisticians to monetary equivalents, and the desire for their expertise to be recognised outside the “statistical community”. This is especially true given the limited or non-existent existing critical literature on environmental accounting.

A third limit is related to the circulation of actors, experts, and organisations within, and sometimes between accounting worlds, which I probably insufficiently make visible. It is first interesting to recall that some organisations are involved in different accounting worlds, but not through the same people, who bring into play different kinds of expert knowledge and networks. The Big Four accounting, auditing, and consulting firms, for instance, are actively involved in both the second and third accounting worlds. In the second accounting world, they are involved through their “consulting” branch, and mainly through environmental economists. In the third accounting world, that of accounting for nature-related risks, they are involved through their accounting and audit branch, through financial accountants. While environmental economists generally have at least a basic knowledge of accounting for nature-related risk (I#4-1), it is not uncommon for financial accountants involved in the latter accounting world to just be unaware of the existence of natural capital accounting (I#11-3). International organisations such as the OECD, Eurostat, the World Bank or UNEP are involved in the first and second accounting worlds, and sometimes even in the third. But their involvement is not the same depending on the accounting world. For the first, and, to a lesser extent, the second, those international organisations were at the origin of the accounting methods and standards developed. For the

third world, and increasingly for the second as well, they mostly follow a trend, or a dynamic, set up by consultants and nature conservation organisations.

To my knowledge, only one individual really moved from one accounting world to the other: a former Head of National Accounts at the Australian Bureau of Statistics, and editor of the System of Environmental-Economic Accounting (SEEA) framework for the UN Statistics Division, who joined the Natural Capital Coalition in 2017 through his own consulting firm, IDEEA Group. I interviewed him during the 2019 EBNS. I think I can say that he felt out of his element, out of his world, deploring discussions that did not involve accounting techniques (I#8-1). This point, although limited, shows the absence of permeability between the different accounting worlds, and thus the relevance of this concept.

Further analysis of the circulation of organisations and experts within each of the accounting worlds would have been useful, particularly with regard to the second accounting world. Indeed, people regularly moved between the different organisations of the natural capital community, from the Big Four firms to UNEP, from IUCN to WBCSD, from WBCSD to small consultancies, or from small consultancies to larger firms. I could also have looked at the relationships between the different member organisations of the natural capital community, and the projects they were involved in together. I have begun a social network analysis of the members of the natural capital community which shows a very dense network of actors, and therefore, ultimately, that the community is not as open and diverse as it claims to be. It also shows, as already mentioned, the Eurocentric feature of the natural capital community, although they increasingly try to recruit members outside Europe. Unfortunately, this social network analysis is not in the stage to be published at the time of writing.

I now turn to the answers to the three research questions of my thesis, which are expressed in the discussion of the five contributions. The first contribution of this thesis is to make a comprehensive empirical study of accounting for nature. This achievement is realised through the concrete reconstitution and restitution of how accounting for nature is discussed in a variety of international arenas. In contrast to existing studies on this theme, I have not assumed, or anticipated, what accounting would do if it was actually realised, but rather looked at how it was discussed, by whom, and where, which prompts to distinguish and conceptualise three accounting worlds for nature drawing from Boltanski and Thévenot's concept of "common worlds". This is how I answered my second research question, namely how, by whom, and for whom accounting for nature is being developed. As has been amply discussed in the previous chapter, the three accounting worlds can be differentiated on many levels, be it the expertise used and legitimised, the equivalence convention used to turn nature into accounting units and metrics, or the "higher common principles" driving each of the accounting worlds. The common thread is the definition that each accounting world gives to nature: a contribution to economic welfare. It should, however, be (re)raised that the last accounting world, that of accounting for nature-related risks, has a more restrictive definition of it, as nature is primarily defined as a parameter to be considered in investment decisions.

Secondly, the thesis, and accounting for nature, is a story of -isation process, which responds more directly to my third research question on the effects of accounting for nature, but which also helps to answer the other two questions. I consider here climatisation and/or environmentalisation if statistics, economics, finance, and accounting come closer to, and are shaped by, environmental thought and governance, and ultimately become relevant for climate or environmental politics (Aykut & Maertens, 2021, p. 502). I also consider the reverse process (economisation, financialisation, "statisticalisation" or "accountingisation", if we can say so) if

climate and/or environmental thought and governance come closer to, and are shaped by, statistical, economic, financial, and accounting thought and governance, so that the former become relevant to the latter. This contribution is also an opportunity to recall the most important dynamics that have historically taken place in each of the accounting worlds.

This thesis has shown that the two processes often occur together – are intertwined. I started the analysis with the first accounting world and the need to reflect environmental issues within core international statistics. At the outset, the first accounting world was developed by “traditional” statisticians working in national and international organisations with a strong interest in environmental issues in the 1980s, an interest that was shaped by the emergence of environmental problems and governance. Environmental accounting then took on a whole new dynamic in the context of environmental governance at the 1992 Rio Earth Summit, with the proposal of creating the SEEA as part of Agenda 21. Environmental accounting thus became relevant for environmental politics, initiating a process of environmentalisation of accounting, and, more precisely, of international statistics. This process continued since the development of the SEEA was given to a statistical organisation, namely the UNSD, so that it was primarily the statistical governance’s agenda that was shaped by the emerging needs of environmental politics, leading to the creation of a “statistical community” regularly debating those issues. The aim to “green” international statistics and GDP, which would have led environmental issues to be shaped by international accounting, was quickly abandoned. The SEEA is not, or not in a straightforward way, debated by statisticians discussing the development of GDP, the so-called “System of National Account” (SNA). And if the SEEA is indeed proposed as an indicator in the context of biodiversity governance, only a few states are compiling their data in relation to it. Statistical thought and governance have only partly been shaped by their environmental counterpart, partly been “environmentalised”; while environmental thought and governance

have not really been shaped by their statistical counterpart. Therefore, although both processes are and were at work in the first accounting world, neither has been fully realised.

In the second accounting world, that of natural capital accounting, the project was initially shaped by ecological economists influenced by both economics and, to a lesser extent, ecology. Speaking of nature in the language of economics has been the engine of this accounting world from the beginning, with the metaphor of nature as natural capital from the end of the 1980s (Pearce et al., 1989), and the following monetary assessment of global ecosystems starting in the late 1990s (Costanza et al., 1997). The aim was to define environmental problems as economic problems, thus prompting an economisation of environmental issues. In terms of governance, this accounting world is much more related to environmental governance than to economic one, in particular to the international assessments of biodiversity and ecosystems in the 2000s (MEA, 2005; TEEB, 2010). It was also environmental-related organisations, namely IUCN and WBCSD, although closely linked to the economic and business world, that created the Natural Capital Coalition in 2014 by removing TEEB for Business and Enterprise from the UN, and more specifically from UNEP. Today, it is difficult to say whether natural capital accounting is more about economics or ecology, as the project lacks coherence, changes according to opportunities and is never really implemented, as shown in the previous chapter including in the second article of the thesis (Maechler & Boisvert, Forthcoming). Moreover, it is discussed in an increasingly hybrid, and unclear, governance context. The European Business and Nature Summit, officially supported by the EU Directorate-General for Environment, looks much more like a business, rather than an environmental summit. Closing the event, the EU Director General for Natural Capital thanked the participants for “this successful business meeting”, before catching himself and adding “business *and nature* meeting” (O#51-2-P).

Thus initially located in environmental governance and leading to the “economisation” of environmental problems, natural capital accounting is increasingly discussed in an economic and more particularly business context. Does this lead to economic, or business governance being shaped by environmental policies? Again, both processes are probably at play, although the economisation of environmental thought and governance is probably much more prevalent.

Finally, the third accounting world, that of accounting for nature-related risks, brings a new process at play, namely the climatisation of accounting for nature itself. While nature accounting was initially developed with the general aim of accounting for the “whole” – if possible – of nature, the third world of accounting is clearly focusing on climate change, with biodiversity and ecosystems becoming secondary issues to be eventually added later. In this context, finance, and more specifically private finance, is becoming increasingly relevant to climate politics since COP 21 in Paris (Aykut, 2020; Crona, Folke, & Galaz, 2021), the moment when Mark Carney took the stage to detail his thoughts on “climate-related risks”. The early project of the IFRS Foundation was also presented in the context of a climate conference, COP 26 in Glasgow. While such a climatisation of finance is now reiterated at each COP, it is difficult to assess the extent to which private finance is really shaped by climate politics. This accounting world has no aim of bringing new information about climate change as such, but first and foremost new information about the riskiness of investments in a warming world. It is not clear whether climate policies are being “climatised” through this accounting world, or whether we are simply witnessing a new form of climate governance made by and for finance. In the third article of my thesis, I made the argument of a financialisation (van der Zwan, 2014, p. 102), in the sense that accounting for nature-related risks increases the power of investors in the politics of the ecological crisis (Maechler, 2022). Climate politics is being much more shaped by private finance and their needs, than the other way around.

Therefore, the first accounting world, that of environmental accounting, leads more to an environmentalisation of international accounting and statistics than to the reverse process, also both processes have not been fully achieved. The second accounting world, that of natural capital accounting, is historically linked to an economisation of environmental governance, turning environmental problems into economic ones, although the reverse process may be increasingly prevalent. Finally, the third accounting world, that of accounting for nature-related risks, was initially a climatisation of finance (and of accounting for nature itself). But as the different projects are developed, including the setting of instruments and standards, “climate finance” increasingly turns into a financialisation of climate politics (and of accounting for nature itself), shaped by the interests of financial actors. It remains to be seen whether those arguments and related dynamics can be related to the broader evolutions, transformations, and changes happening in global environmental governance. Hopefully, this thesis contributes to the political economy literature on global environmental governance that tried to assess this broader relationship between economics, business, and finance on the one hand, and global environmental problems on the other (Clapp & Dauvergne, 2005; Dauvergne & Shipton, 2023; Paterson & Newell, 2010).

Thirdly, this contributes to a long-standing debate on the economic valuation and commodification of nature (Boisvert, 2016; Castree, 2003; Dempsey, 2016; Robertson, 2006). Here, my contribution lies more specifically in how economic valuation and commodification of nature can continue to figure so prominently in environmental conservation debates despite its limited achievements, most particularly when it comes to the second accounting world, that of natural capital accounting. In this accounting world, which has been more studied and analysed than the other two (see above for an explanation), new promising solutions are

proposed one after another, slightly reframed, what Fletcher (2023) recently coined as “failing forward” in relation to market-based instruments for nature, launched one after the other, each promising to compensate for the shortcomings of the previous one and thus achieve better outcomes. In the second article of the thesis, I have linked this promising process to Blühdorn’s concept of symbolic politics, which entails “the performance of seriousness, the performance of authentic (eco-)politics [...which] articulates demands which are not supposed to be taken seriously and implemented, but which are nevertheless constantly rearticulated with politicians being criticized – as part of the performance – for not implementing them” (2007, pp. 267–268). Through such symbolic politics, natural capital accounting and the economic valuation of nature are being spectacularised, staged, and performed, to the point that the reality of natural capital accounting, its anchoring in the practice of the actors, is relegated to the second level. In the same vein as Biehl-Missal analysis of business assembly, such spectacularisation, staging, and performance “persuasively create a certain reality” (2011, p. 634). I have proposed that the most prominent effect of natural capital accounting, here linked more specifically to the third research question, is to generate a system of discourse and knowledge that subverts all exit strategies from the ecological crisis into monetary valuation practices, to reinforce hegemonic capitalist representations of nature, and to thwart the imagining of “other natures”, which I have proposed to term “valuation-centrism”, after J.K. Gibson-Graham’s capitalocentrism (2006).

Fourth, this thesis contributes to the literature on standards, standardisation, and how they embody competing and divergent forms of authority in global governance (Clapp, 1998; Graz, 2019; Graz & Nölke, 2011; Green, 2014; Yates & Murphy, 2009). In the first accounting world, the internationally recognised authority of the United Nations Statistical Commission in setting

standards for GDP is not sufficient to ensure that environmental accounting standards, developed by the same organisation, are disseminated in states' practices.

In the second accounting world, standards for natural capital accounting entail a competition between different forms of private authority, especially between the Natural Capital Coalition and ISO. The latter, whose authority in setting standards has been widely documented (Hauert et al., 2016; Mazower, 2013; Yates & Murphy, 2009), has been pitted against the Natural Capital Coalition and its powerful supporters (e.g. the WBCSD, IUCN, and the European Commission). ISO standards have rarely been mentioned in discussions on existing natural capital accounting standards. Few people were even aware of their existence. Being long established in the field of standardisation is therefore not enough to establish oneself in the specific field of natural capital accounting, which is highly concentrated around one organisation. Moreover, the standards elaborated by the natural capital community have the particularity of participating in this “symbolic politics” described above, and more specifically in the “seriousness” of the project (Blühdorn, 2007). The natural capital community is indeed in a constant process of standardisation, with new standards being set and published every year, one after the other, without being able to judge their potential use. Actors active in this field tend to refer to the standards as “a standard soup” (O#7-2-P), and the most recent initiatives, such as “Aligning accounting approaches for nature”, precisely have the objective of “standardising the standards”.

Finally, the third accounting world, that of accounting for nature-related risks, involves a competition between financial accounting standard-setters that has already been documented in relation to financial accounting standards and their takeover by the IFRS foundation in the early 2000s (Leblond, 2011; Mügge & Stellinga, 2015; Perry & Nölke, 2006). It entails more

precisely a competition between a private authority that succeeded to establish itself as the global guardian of financial accounting standards, and a public authority, the European Commission, whose project should be seen under to broader objective of becoming a global leader in the field of sustainable finance (Baer, Campiglio, & Deyris, 2021). This global aim is confirmed by the fact that non-EU companies will be required as of 2028 to comply with the CSRD, i.e., the EU standards, as long as their activities are on the EU territory. Moreover, the foreign subsidiaries of European companies will also have to comply with European standards. Combined with the U.S. Securities and Exchange Commission's project, the prospect of a "standards war" (Yates & Murphy, 2019, p. 243) in relation to accounting for nature, particularly in the context of the third accounting world, is to be expected.

Finally, the thesis contributes to IPE and cognate fields debates on risk and uncertainty, both from a theoretical and empirical point of view. Theoretically, the first article of the thesis made an innovative argument about the epistemic and ontological limits in the substitution of risk for uncertainty, and the need to acknowledge those limits by pluralising knowledge (Maechler & Graz, 2022). We have seen that this argument has empirical value, particularly for answering the first research question on the relationship between accounting and the global ecological crisis: accounting for nature should enable decisions and actions to be taken out of uncertainty. However, these decisions and actions are embodied in specific policy objectives that underpin each of the accounting worlds, so that two ways are proposed to get out of this state of uncertainty: risk mitigation or management. From this view, only the third accounting world, that of accounting for nature-related risks, has the explicit policy objective of transforming uncertainty into a set of *manageable* risks; the other two, which equate with what I termed as "impact accounting", or "risk mitigation", aim to reduce the origin of uncertainty so that we do not have to transform it into manageable risks, which in any case is recognised as a very difficult

task given the complexity of biodiversity and ecosystems' measurement (Bartkowski et al., 2015). We turn here again to the effects of accounting for nature on the global political economy of the ecological crisis. The different projects either fail in their attempt of converting the uncertain time of the crisis into decisions and actions – the first and second accounting worlds do not allow uncertainty to be reduced for different reasons mentioned in this thesis –, or, in the third accounting world, uncertainty is reduced, turned into some form of manageable risks, but only for some actors of the global political economy, primarily investors. The concepts of risk and uncertainty thus also provide a good understanding of the effects of accounting for nature, and more particularly of accounting for nature-related risks.

To conclude, why is nature still not accounted for as a response to the global ecological crisis despite the apparent international consensus on such a principle over more than thirty years? This was the starting puzzle of this thesis. The crux of this question is the one of consensus. In all accounting worlds, accounting for nature is viewed as a depoliticised solution to global environmental problems, whether it is through the claimed objectivity of statistics in the first (although it is balanced and nuanced by the importance of legal rules, embodied in unequal ecological exchanges), the incantatory and “spectacularised” character of the second, and the claimed ability of finance to solve global problems in the third. This idea of apparent consensus, which explains the lack of implementation of accounting for nature projects, is also well captured by the supposedly “pragmatism” of this solution to environmental problems.

Although I have talked a lot about pragmatism here, it does not always have the same meaning, and, more importantly, this pragmatism does not always achieve the desired objectives. In the first accounting world, pragmatism is mostly defined in relation to the second accounting world and the monetary valuation of nature, which is a source of internal conflict within the statistical

community. Pragmatism is opposed to “statistical objectivity”, which the monetary equivalent would undermine. As discussed, the second world of accounting has fully embraced this pragmatism: from Pearce to today, the belief that the monetary equivalent and concepts of natural capital, ecosystem services, or natural assets speak to many and that making nature visible in economic transactions will lead anyone and everyone to realise and protect nature’s values, not altruistically, but selfishly, is still a driving force in this accounting world. But is it really “pragmatic” to repeat the same message over and over again without getting the desired results? Obviously, although the argument of natural capital accounting’s supporters is the pragmatism of their respective projects, it is sure that this is above all an ideological one, just as is economics, including environmental economics (Røpke, 2020). The “real” pragmatism may well be found in the third accounting. It focuses primarily on what may be partly possible given the power relations at stake in global climate governance: giving up on mitigating and focusing on managing risks. It gives this task, or power, to those who already have it, namely (private) finance. It also gives up, at least momentarily, on the task of dealing with the complexity of biodiversity and ecosystems’ measurement (Kedward, Ryan-Collins, et al., 2022). Viewed differently, accounting for nature-related risks is thus the project of renunciation. Perhaps even more than the second, the third accounting world “deadens the imagination of ‘other [accounting] worlds’ and shuts down politics” (Healy & Gibson-Graham, 2019, p. 1181).

Finally, the fact that accounting for nature, indistinctively of the accounting, would be a means to solve the global ecological crisis is far from evident. As it is, accounting for nature is just about new information, filling what is regularly called an “information gap”. It implicitly presumes that human activities in general, or certain categories of actors in particular contribute to climate change and degrade biodiversity and ecosystems due to a lack of legible information

as if climate change and biodiversity loss were the outcomes of free and rational choices and not the unintended effect of structural power relations. Focusing on the measurement of tons of mass, nature values, or climate financial risks, without more obligations, distracts from the more fundamental and divisive issues of recognising, framing, limiting and renegotiating rights over nature.

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Appendix

Appendix 1: List of events (observations)

Listed by chronological order

Observation	Event	Location & Date	Main organiser
O#1-2-D	Séminaire annuel de l'Évaluation française des écosystèmes et des services écosystémiques	Paris 4 October 2018	Évaluation française des écosystèmes et des services écosystémiques (Efese)
O#2-3-D	Geneva 4 th summit on sustainable finance https://sfgeneva.org/4th-geneva-summit-on-sustainable-finance/	Geneva 7 December 2018	Sustainable Finance Geneva
O#3-2-P	ISO/TC 207/SC1/WG8 Meeting	Beirut 13-15 March 2019	International Organization for Standardization (ISO)
O#4-2-D	#IPBES7 Media Launch #GlobalAssessment Webcast https://ipbes.net/webcast-0	Online 6 May 2019	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
O#5-2-P	We Value Nature webinar on natural capital	Online 3 October 2019	We Value Nature (EU Horizon 2020 project)
O#6-3-D	Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting, 36 th session https://unctad.org/meeting/intergovernmental-working-group-experts-international-standards-accounting-and-reporting-6	Geneva 30 October–1 November 2019	United Nations Conference on Trade and Development (UNCTAD)
O#7-2-P	European Business and Nature Summit: Building action for nature and people https://ec.europa.eu/environment/biodiversity/business/ebns/ebns-2019/index_en.htm	Madrid 7-8 November 2019	European Commission
O#8-1-D	Joint OECD/UNECE Seminar on Implementation of SEEA	Geneva 13-14 February 2020	United Nations Economic Commission for Europe (UNECE)

	https://unece.org/info/Statistics/events/17750		
O#9-2-D	Valuing Nature Live Stream https://www.youtube.com/watch?v=2JAEB_VTr4	Online 21 February 2020	Royal Society
O#10-2-D	Launch of UNEP FI Corporate Impact Analysis Tool & Portfolio Impact Analysis Tool for Banks https://www.unepfi.org/events/positive-impact-events/launch-unep-fi-impact-analysis-tools/	Online 2 April 2020	United Nations Environment Programme (UNEP)
O#11-2-D	Net Impact Approaches Webinar https://vimeo.com/423182065/b99d34e992?mc_cid=ea7ebd2c56&mc_eid=b64813a26c	Online 20 May 2020	Sustain Value
O#12-2-D	Valuing Nature with Impact Measurement and Green Accounting https://www.youtube.com/watch?v=iLMB7mEUbCE	Online 22 May 2020	Corporate Knights
O#13-2-P	We Value Nature's Virtual Office Hour call https://wevaluenature.eu/node/97	Online 26 May 2020	We Value Nature (EU Horizon 2020 project)
O#14-1-D	Linking natural capital accounting to policy in Africa https://seea.un.org/events/african-nca-community-practice-webinar-linking-natural-capital-accounting-policy-africa	Online 28 May 2020	Africa Natural Capital Accounting Community of Practice
O#15-2-D	Sustainability after COVID-19: Valuing nature in the post-pandemic world https://www.unep.org/events/workshop/webinar-sustainability-after-covid-19-valuing-nature-post-pandemic-world	Online 2 June 2020	United Nations Environment Programme (UNEP)
O#16-1-D	Revision of the SEEA EEA statistical standard https://seea.un.org/events/african-nca-community-practice-	Online 4 June 2020	Africa Natural Capital Accounting Community of Practice

	<u>webinar-revision-seea-eea-statistical-standard</u>		
O#17-3-D	Soutenabilités : Quelle comptabilité pour un “après” soutenable – ou comment mesurer ce qui compte vraiment ? <u>https://www.strategie.gouv.fr/debats/seminaire-soutenabilites-cycle-1-seance-23-comptabilite-un-apres-soutenable-mesurer-compte</u>	Online 19 June 2020	France Stratégie
O#18-2-P	We Value Nature’s Virtual Office Hour call <u>https://wevaluenature.eu/OfficeHour08</u>	Online 27 August 2020	We Value Nature (EU Horizon 2020 project)
O#19-2-D	Combining Forces on Natural Capital - Working with the Private Sector <u>https://vimeo.com/461755032</u>	Online 03 September 2020	Capitals Coalition
O#20-2-D	Natural Capital, Business & Sustainable Markets <u>https://capitalscoalition.org/events/natural-capital-business-sustainable-markets/</u>	Online 17 September 2020	Capitals Coalition
O#21-1-D	26th Meeting of the London Group on Environmental Accounting <u>https://sea.un.org/events/london-group-environmental-accounting-26th-meeting</u>	Online 5-8 October 2020	London Group of the System of Integrated Environmental and Economic Accounting (SEEA)
O#22-2-P	Principles of Integrated Capitals Assessments – open consultation launch <u>https://capitalscoalition.org/publication/principles-of-integrated-capitals-assessments/</u>	Online 15 October 2020	Capitals Coalition
O#23-2-D	MAIA webinar ‘Introduction and Update on SEEA Ecosystem Accounting’ <u>https://maiaportal.eu/news/maia-webinar-introduction-and-update-seea-ecosystem-accounting</u>	Online 26 October 2020	Mapping and Assessment for Integrated ecosystem Accounting (MAIA) ((EU Horizon 2020 project)

O#24-2-D	The Use of Natural Capital Accounts in Policy Scenario Analysis https://seea.un.org/events/african-nca-community-practice-webinar-use-natural-capital-accounts-policy-scenario-analysis	Online 29 October 2020	Africa Natural Capital Accounting Community of Practice
O#25-2-D	Value Balancing Alliance 2020 Korea https://www.value-balancing.com/en/meet-us/experience-us/introduction-event-korea.html	Online 30 October 2020	Value Balancing Alliance (VBA)
O#26-3-D	Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting, 37 th session https://unctad.org/meeting/intergovernmental-working-group-experts-international-standards-accounting-and-reporting-7	Online 2–6 November 2020	United Nations Conference on Trade and Development (UNCTAD)
O#27-3-D	Accounting for Climate https://www.youtube.com/watch?v=8iXZ6nPOLB8	Online 5 November 2020	Climate Disclosure Standards Board (CDSB)
O#28-3-D	IFRS Trustee webinars on sustainability reporting https://www.ifrs.org/projects/completed-projects/2021/sustainability-reporting/trustee-webinars-on-sustainability-reporting/	Online 17 November 2020	International Financial Reporting Standards Foundation (IFRS)
O#29-2-D	Standard presentation – Natural capital accounting for organizations https://www.bsigroup.com/en-GB/our-services/events/webinars/2020/bs-8632/	Online 26 November 2020	British Standards Institution (BSI)
O#30-2-P	European Business and Nature Summit – Green economic recovery – Reshaping business for nature and people https://ec.europa.eu/environment/news/european-business-nature-summit-2020-12-08_en	Online 8-9 December 2020	European Commission

O#31-2-D	Co-Creating Impact Summit https://www.novartis.com/news/co-creating-impact-summit-society-and-planet	Online 9 December 2020	Novartis
O#32-3-D	European Lab - PTF-NFRS - European organisations and other European countries focus https://www.efrag.org/Meetings/2012211530350362/PTF-NFRS-OUTREACH-EVENT--European-organisations-and-other-European-countries-focus	Online 15 January 2021	European Financial Reporting Advisory Group (EFRAG)
O#33-3-D	European Lab - PTF-NFRS - Financial institutions focus https://www.efrag.org/Meetings/2012211532359429/PTF-NFRS-OUTREACH-EVENT--Financial-Institutions-Focus	Online 18 January 2021	European Financial Reporting Advisory Group (EFRAG)
O#34-3-D	EFRAG joint outreach events – Preparatory work on EU non-financial reporting standards https://www.efrag.org/News/Project-458/SAVE-THE-DATE--European-Lab-EFRAG-joint-outreach-events-Preparatory-work-on-EU-non-financial-reporting-standards--13-to-22-January-2021	Online 15, 16, 21 January 2021	European Financial Reporting Advisory Group (EFRAG)
O#35-3-D	IFRS Trustees Meeting https://www.ifrs.org/projects/completed-projects/2021/sustainability-reporting/#meetings	Online 1 February 2021	International Financial Reporting Standards Foundation (IFRS)
O#36-2-D	Launch of full report of The Economics of Biodiversity: The Dasgupta Review https://www.cser.ac.uk/news/launch-full-report-economics-biodiversity-dasgupta/	Online 2 February 2021	The Royal Society
O#37-3-D	IFRS Trustee webinars on sustainability reporting https://www.ifrs.org/projects/work-plan/sustainability-	Online 23 February 2021	International Financial Reporting Standards Foundation (IFRS)

	reporting/trustee-webinars-on-sustainability-reporting/		
O#38-1-D	MAIA Webinar V: Monetary Accounts in the SEEA https://maiaportal.eu/media-center/webinar	Online 23 February 2021	Mapping and Assessment for Integrated ecosystem Accounting (MAIA) ((EU Horizon 2020 project)
O#39-2-D	New system of natural capital accounting (SEEA EA) - Virtual Press Conference https://media.un.org/en/asset/k18/k18ktckcbt	Online 2 March 2021	United Nations
O#40-2-D	Launch of the Align project – Aligning accounting approaches for nature https://ecoacsa.com/en/align-eng/	Online 10 March 2021	European Commission
O#41-1-D	Joint OECD/UNECE Seminar on SEEA Implementation https://unece.org/info/events/event/348372	Online 09-11 March 2021	United Nations Economic Commission for Europe (UNECE)
O#42-2-P	We Value Nature 10-day challenge https://wevaluenature.eu/10-day-challenge	Online 11-24 March 2021	We Value Nature (EU Horizon 2020 project)
O#43-3-D	21ème session du séminaire financement de la transition énergétique, Reporting climatique : où en est-on ? http://www.chair-energy-prosperity.org/event/seminaire-reporting-climatique-on/	Online 30 March 2021	Chaire Energie et Prospérité
O#44-3-D	The way forward on non-financial reporting https://www.youtube.com/watch?v=7w_mN0JITi0	Online 18 May 2021	Climate Disclosure Standards Board (CDSB)
O#45-3-D	European lab business model, sustainability risks and opportunities reporting (1) https://www.efrag.org/Activities/2010051121466598/Risks-opportunities-and-business-model#	Online 25 May 2021	European Financial Reporting Advisory Group (EFRAG)

O#46-3-D	Creating value and managing impact through integrated sustainability disclosure https://www.accaglobal.com/vn/en/technical-activities/technical-resources-search/2021/june/creating_value_managing_impact_through_integrated_sustainability_disclosure.htm	Online 2 June 2021	Association of Chartered Certified Accountants (ACCA)
O#47-3-D	Integrated multi-capital performance research center – 1st annual conference https://multi-capital-performance.audencia.com/en/articles/news/back-to-the-first-annual-conference-of-the-research-centre/?no_cache=1&cHash=0f8ab21723598b36c97a49a3d7f41ce4	Online 22 June 2021	Audencia
O#48-2-D	The Value of Nature: Finance for Biodiversity https://www.genevaenvironmentnetwork.org/events/the-value-of-nature-finance-for-biodiversity-intecol-2022/	Geneva 30 August 2022	Geneva Environment Network
O#49-2-D	Online dialogue meetings for stakeholders on the nomination of experts and fellows for the business and biodiversity assessment https://ipbes.net/events/online-dialogue-meetings-stakeholders-nomination-experts-and-fellows-business-and	Online 6 October 2022	Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES)
O#50-2-D	International Quarry Award Ceremony 2022 https://www.quarrylifeaward.fr/node/83246	Brussel 17 October 2022	Heidelberg Material
O#51-2-P	European Business & Nature Summit 2022: Embark on a journey to nature positive! https://environment.ec.europa.eu/european-business-and-nature-summit-2022_en	Brussel 18-19 October 2022	European Commission
O#52-2-D	Global Biodiversity Framework at COP15 in	Online 22 February 2023	Aligning Accounting Approaches for Nature (EU)

	Montreal, Canada, get ready to assess and disclose your risks, dependencies and impacts on biodiversity		
O#53-3-D	Vers une normalisation des divulgations d'informations climatiques des entreprises : les initiatives européenne et internationale http://www.chair-energy-prosperity.org/research-area/regulations-financieres-financements-innovants/vers-normalisation-divulgations-dinformatons-climatiques-entreprises-initiatives-europeenne-internationale/	Online 21 March 2023	Chaire énergie et prospérité

Appendix 2: List of semi-structured interviews

Interview	Information	Date & Location
I#1-2	Engineer, consultant and academic from Sweden. ISO expert group participant	26 November 2018 Online
I#2-2	2. Engineer, academic. ISO expert group participant	14 December 2018 Online
I#3-2	3. Business Lawyer, consultant. ISO expert group participant	22 January 2019, Aarau, Switzerland
I#4-1	4. Environmental economist. Employee of UNEP	8 May 2019 Geneva, Switzerland
I#5-1	5. Environmental economist. Employee of UNEP	8 May 2019 Geneva, Switzerland
I#6-2	6. Environmental economist. UNEP-FI	22 May 2019 Geneva, Switzerland
I#7-2	7. Environmental economist IUCN	24 May 2019 Online
I#8-1	8. Statistician, consultant IDEEA Group, former editor of SEEA	7 November 2019 Madrid, Spain
I#9-3	9. Financial accountant Director of research at a “Big Four”	26 November 2019 Online
I#10-3	10. Economist UNCTAD/ISAR	27 November 2019 Geneva, Switzerland
I#11-3	11. Accountant Head of Investment and Enterprise, UNCTAD	27 November 2019 Geneva, Switzerland
I#12-2	12. Environmental economist Business for Nature (coalition)	4 August 2020 Online
I#13-3	13. Accountant Member of EFRAG’s Task Force	19 October 2020 Online
I#14-2	14. IPBES expert	14 December 2022

Appendix 3: List of ethnographic interviews

	Information	Context
EI#1-2	ISO expert group participant	ISO/TC 207/SC1/WG8 Meeting Beirut, 13-15 March 2019
EI#2-2	ISO expert group participant	ISO/TC 207/SC1/WG8 Meeting Beirut, 13-15 March 2019
EI#3-2	ISO expert group participant	ISO/TC 207/SC1/WG8 Meeting Beirut, 13-15 March 2019
EI#4-2	ISO expert group participant	ISO/TC 207/SC1/WG8 Meeting Beirut, 13-15 March 2019
EI#5-2	ISO expert group participant	ISO/TC 207/SC1/WG8 Meeting Beirut, 13-15 March 2019
EI#6-3	UN High Executive in Auditing	Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting, 36 th session Geneva, 30 October–1 November 2019
EI#7-3	IASB member	Intergovernmental Working Group of Experts on International Standards of Accounting and Reporting, 36 th session Geneva, 30 October–1 November 2019
EI#8-2	Biodiversity consultant	European Business and Nature Summit: Building action for nature and people Madrid, 7-8 November 2019
EI#9-2	Employee of the Natural Capital Coalition	European Business and Nature Summit: Building action for nature and people Madrid, 7-8 November 2019
EI#10-2	Employee of a natural capital accounting initiative	European Business and Nature Summit: Building action for nature and people Madrid, 7-8 November 2019
EI#11-1	State national statistician	Joint OECD/UNECE Seminar on Implementation of SEEA Geneva, 13-14 February 2020
EI#12-2	Biodiversity consultant	International Quarry Award Ceremony 2022

		Brussel, 17 October 2022
EI#13-2	Business sustainability representative	International Quarry Award Ceremony 2022 Brussel, 17 October 2022
EI#14-2	Biodiversity consultant	European Business & Nature Summit 2022: Embark on a journey to nature positive! Brussel, 18-19 October 2022

Appendix 4: Corpus of documents

Documents (listed in alphabetic order)	Sub-case
Bartelmus P, Stahmer C and Tongeren J van (1991) Integrated Environmental and Economic Accounting: Framework for a SNA Satellite System. <i>Review of Income and Wealth</i> 37(2): 111–148.	1
Carney, M. (2015) <i>Mark Carney: Breaking the tragedy of the horizon – climate change and financial stability</i> . London: Bank of England.	3
Costanza R, d’Arge R, Groot R de, et al. (1997) The value of the world’s ecosystem services and natural capital. <i>Nature</i> 387(6630): 253–260.	2
Costanza, R., de Groot, R., Sutton, P., van der Ploeg, S., Anderson, S. J., Kubiszewski, I., ... Turner, R. K. (2014) Changes in the global value of ecosystem services. <i>Global Environmental Change</i> , 26, 152–158.	2
Daily, G. (Ed.) (1997) <i>Nature’s Services: Societal Dependence On Natural Ecosystems</i> . Washington, DC: Island Press.	2
Dasgupta P (2021) <i>The Economics of Biodiversity: The Dasgupta Review</i> . London: HM Treasury.	2
Deloitte, Ernst & Young and True Price (2014) <i>The Business Case for True Pricing – Why you will benefit from measuring, monetizing and improving your impact</i> .	2
EFRAG (2021) <i>Proposals for a relevant and dynamic EU sustainability reporting standard setting</i> . Brussels: European Financial Reporting Advisory Group.	3
EFRAG (2022) <i>[Draft] European Sustainability Reporting Guidelines 1 Double materiality conceptual guidelines for standard-setting</i> .	3
El Serafy, S. (1997) Green accounting and economic policy. <i>Ecological Economics</i> , 21(3), 217–229.	1
European Commission. (2019). <i>The European Green Deal</i> . Brussels: European Commission.	2/3
Fischer-Kowalski, M. (2011) Decoupling Natural Resource Use and Environmental Impacts from Economic Growth: A Report of the Working Group on Decoupling to the International Resource Panel. Paris: UNEP United Nations Environment Programme, International Resource Panel.	1
FSB. (2015). <i>Press release: FSB to establish Task Force on Climate-related Financial Disclosures</i> . Financial Stability Board.	3
Gray R (1990) <i>Greening of Accountancy: The Profession After Pearce</i> . London: Chartered Association of Certified Accountants.	2
IFRS Foundation (2020) <i>Consultation Paper on Sustainability Reporting</i> . London: IFRS.	3

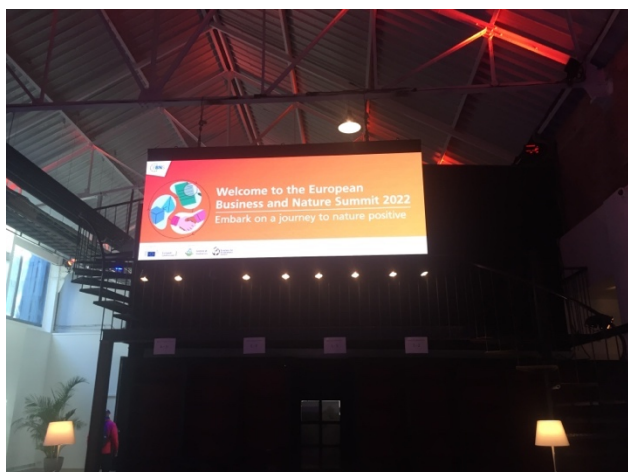
IFRS Foundation (2022a) [<i>Draft</i>] <i>IFRS S1 General Requirements for Disclosure of Sustainability-related Financial Information</i> . London: IFRS	3
IFRS Foundation (2022b) [<i>Draft</i>] <i>IFRS S2 Climate-related Disclosures</i> . London: IFRS	3
IPBES (2019) <i>Global Assessment Report on Biodiversity and Ecosystem Services</i> . Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.	2
IPBES. (2016). <i>The assessment report on pollinators, pollination and food production: Summary for policymakers</i> . Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.	2
IPBES (2022) <i>Summary for policymakers of the methodological assessment regarding the diverse conceptualization of multiple values of nature and its benefits, including biodiversity and ecosystem functions and services (assessment of the diverse values and valuation of nature)</i> . Bonn: Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services.	2
ISO (2016) <i>FAQ on ISO 14007 Environmental management: Determining environmental costs and benefits</i> . ISO.	2
ISO (2018) ISO 14008:2018 - Monetary Valuation of environmental impacts and related environmental aspects.	2
ISO (2018) ISO 14007:2019 - Environmental management—Guidelines for determining environmental costs and benefits.	2
ISO (2019) <i>Calculating the value of the environment with new ISO standard</i> .	2
Kering (2013) <i>Environmental profit and loss (EP&L) 2012</i> . Paris: Kering.	2
Kokkelenberg, E. C., & Nordhaus, W. D. (Eds.) (1999) <i>Nature's Numbers: Expanding the National Economic Accounts to Include the Environment</i> . Washington, DC: National Academies Press.	1
KPMG (2014) <i>A New Vision of Value. Connecting Corporate and Societal Value Creation</i> . Amstelveen: KPMG.	2
Lutz, E. (Ed.) (1993) <i>Toward improved accounting for the environment</i> . Washington, DC: World Bank.	1
Matthews, E. (2000) <i>The weight of nations material outflows from industrial economies</i> . Washington, DC: World Resources Institute.	1
MEA (ed.) (2005) <i>Our Human Planet: Summary for Decision-Makers</i> . Millennium Ecosystem Assessment series. Washington, DC: Island Press.	2
Natural Capital Coalition (2016) <i>Natural Capital Protocol</i> .	2
Natural Capital Coalition (2016) <i>The path towards the natural capital protocol: A primer for business</i> . Natural Capital Coalition.	2

Natural Capital Coalition (2018) <i>Connecting Finance and Natural Capital: A Supplement to the Natural Capital Protocol</i> . Natural Capital Coalition.	2
Natural Capital Coalition (2020) <i>Natural Capital Coalition Improving Nature's Visibility in Financial Accounting</i> .	2
Pearce DW, Markandya A and Barbier EB (1989) <i>Blueprint for a Green Economy</i> . London: Earthscan.	1
PwC (2015) <i>Valuing corporate environmental impacts</i> . London: PwC.	2
Repetto, R., Magrath, W., Wells, M., Beer, C., & Rossini, F. (1989) <i>Wasting Assets. Natural Resources in the National Income Accounts</i> . Washington: World Resources Institute.	1
Securities and Exchange Commission. (2022). <i>The Enhancement and Standardization of Climate-Related Disclosures for Investors</i> . Securities and Exchange Commission.	3
TCFD (2017) <i>Recommendations of the Task Force on Climate related Financial Disclosures</i> . Task Force on Climate-Related Financial Disclosures.	3
TEEB (2010) <i>The Economics of Ecosystems and Biodiversity in Business and Enterprise</i> (ed. J Bishop). Geneva: TEEB.	2
United Nations (1987) <i>Report of the World Commission on Environment and Development Our Common Future</i> . New York: United Nations.	1
United Nations (ed.) (2012) <i>System of Environmental-Economic Accounting—Experimental Ecosystem Accounting</i> . New York: United Nations.	1
United Nations (ed.) (2014) <i>System of Environmental-Economic Accounting 2012: Central Framework</i> . New York: United Nations.	1
United Nations (ed.) (2021) <i>System of Environmental-Economic Accounting—Ecosystem Accounting</i> . New York: United Nations.	2
United Nations Statistics Division (1993) <i>Handbook of National Accounting. Integrated Environmental and Economic Accounting. Interim version</i> . 61. New York: United Nations.	1
UNSC. (2021). <i>Fifty-second session. Agenda item 7: Report of the Commission on its fifty-second session</i> . New York: United Nations.	1
UNSC. (2020). <i>System of Environmental-Economic Accounting—Ecosystem Accounting Global Consultation on the complete document: An overview</i> . New York: United Nations.	1
Uno, K., & Bartelmus, P. (Eds.) (1998) <i>Environmental Accounting in Theory and Practice</i> . Dordrecht: Kluwer.	1
VBA (2021) <i>Methodology Impact Statement General Paper Version 0.1</i> . February. Frankfurt am Main: Value Balancing Alliance.	2

Appendix 5: Extract from observation notes – European Business and Nature Summit 2022, Brussels

NOTES JOUR 1

Entrée 9 :45



À l'entrée les gens se demandent si c'est la première fois : « yes, I did all of them », répond une personne (consultant je pense).

Mark Gough (directeur NCC) salue tout le monde



Je prends le café à la même table haute que deux hommes de Nestlé (on a tous des badges).
Un des deux de Nestlé commence à me parler pour dire qu'on vient du même coin - interrompu par une dame qui nous indique que ça va commencer

Tout le monde prend son café et discute (beaucoup se connaissent, quelque uns sont seuls)

Début 10 : 05 avec petite musique (petite musique utilisée pour que les gens aillent dans la salle).

Introduction

EU commissioner (en vidéo)

Mot "journey" à tout va.

« We are turning at you » (business)

« The journey is underway, And I am glad to be travelling with you » *****



Keynote: shifting business to embed nature

ROB HOPKINS —> Introduit par Humberto Delgado Rosa comme qqn qui permet « d’imaginer la journey »

Il est là pour mettre l’ambiance, pour mettre tout le monde de bonne humeur, mais bien dans l’ambiance du changement. Il remplit très bien son rôle. Les gens sont enthousiastes.

Présentation met en avant « imagination as transformative force of change »

« I’ve been to the future, its amazing »

Il amène une boîte en carton écrit “time machine”, dis qu’il a amené une machine à remonter le temps et qu’il était difficile de la ramener ici avec Brexit... tout le monde rigole.

« Pas parce que les gens n’arrivent pas à imaginer quelque chose, que cela n’est pas possible, et pas mieux ».

Les gens jouent bien le jeu → On doit fermer les yeux, et s’imaginer dans le futur - sentir, voir, toucher le futur - faire marcher nos sens (il le fait faire aux gens, ça dure 2-3 min les yeux fermés)

On doit se tourner vers la personne à côté de nous pour discuter de ce que l’on a ressenti.

Puis dire ce que l’on imaginait.

→ Il se tourne vers l’audience pour les réponses.

Réponses :

« Open-ended possibilities »

Il montre (en image) un exemple de XR qui a occupé un pont pendant deux semaines à Londres et mis de arbres ; il dit que c’était beau – tout le monde semble d’accord (*décalage total*)***

Il ne donne que des succès stories - déconnectées les unes aux autres (e.g., une entreprise qui donne un siège à « la nature » dans son CA, ou des assemblées participatives classiques —> des processus où l'imagination serait au cœur...

Termine en faisant de la promotion pour son podcast et son livre.

OPENING PLENARY: POLICY TO ACCELERATE THE TRANSITION TO NATURE POSITIVE
(10:35)

Florika Fink-Hooijer - Director-General, Environment Department, European Commission
(le moderator, Humberto, fait une petite blague en disant qu'il va modérer sa cheffe, tout le monde rigole, l'enthousiasme est bien là)

Speech mi-politique, mi-technique, mi-incantatoire.

« The problem is that we don't account for natural capital »
« Identify, assessing, and being transparent »
« Measuring, being transparent, and act »

Elle déroule des mots-clés comme si c'était tout nouveau. Demande aux entreprises de réfléchir à leur Environmental footprint,

Anne Larigauderie - IPBES

Explique son rapport - la situation (s'excuse presque de ne pas être aussi « inspirational » que Rob.)

Parle du rapport sur les Multiple Values —> “almost only one method is used, the nature-based valuation”.

Heimo Scheuch, CEO, Wienerberger AG

« We forgot what value is; we have lost the respect for nature »
« Regulation is good, regulation is important. Transparency is even more important ». ***
« We need to empower people much more » (what regulation do not do)

« We have a positive image of the future. I hate these media with a bad image of the future everyday...
we must be much more positive ».

Cela continue sur la positivité comme force de transformation

Lidwin van Velden, CEO, NWB Bank and President, European Association of Public Banks

Explique qu'elle revient de la conférence à Washington de IMF&WB où climat était au cœur
Explique comment les banques aident déjà – peut intéressant.

« We live in a world of uncertainty, but we need to act now. » *****

Florika Fink-Hooijer reprend Heimo Scheuch: « obviously, we need regulations ». (Tout le monde rigole, elle le regarde, il rigole).

Elle explique toutes les méthodologies développées au plan EU en ce moment.

« If it don't get measured, it don't get to the point » ***** *why measuring*

Question (11:15)

- Pour Heimo: « how do you concretely do/ measure the empowerment of your employees? »
- Pour tout le monde : « why we don't separate intrinsic values and market values? »

Question peuvent aussi être posée via internet (menti)

Conclusion du panel: « we need an organized transformation »

11:30 : pause-café

Mark Gaugh de NCC le prend avec Yohan Lammermant (consulting firm, mais semble représenter à lui seul EU @BB).

Choix du panel - hésitation avec celui sur les normes - même si tout porte à croire que chaque intervenant va simplement présenter sa norme en disant que c'est la meilleure (EFRAG, GRI, VBA) —> au final, décision de suivre un autre panel car peu de chance d'apprendre qqch de nouveau. (Panel sur les normes dans la grande salle)

Panel suivi :

“From the why to the how”: Introduction on existing methodological frameworks to guide companies in addressing biodiversity in their action sphere

Speakers:

- Pierre-Alexandre Bapst, Corporate Sustainability Officer, Hermès International
- Nadine McCormick, Manager, Nature Action, World Business Council for Sustainable Development

Moderator:

- Bart Corijn, Change facilitator, The Shift
- Titus Ghyselincx, Program Manager Food & Agriculture, WWF Belgium

Participants:

3/4 business environ

Session avec des gens assez jeunes, surtout des femmes.

Shift + WWF Belgium new project: « Biodiversity in Action »

Question sur menti: “where are you in your biodiversity journey?”

Nadine McCormick (préside la séance)

—> Fait lever les mains aux gens pour les diviser catégorie (business, etc)

Présente image de « goal for nature » du WWF (« Nature positive by 2030 ») —> demande qui connaît déjà ; presque tout le monde dit connaître.

—> Dis qu'elle veut s'inspirer de Rob, parle d'un futur qu'on veut.

—> On ne sait pas encore le *how*

« the planet needs to become nature-positive » (?)

Slide—> « disclose, disclose, disclose »

Slide avec toutes initiatives et méthodes

Première étape c'est « access & identify » avec un outil de « materiality assessment » (SBTN, based on ENCORE), mais ensuite dernière des 6 phases c'est « disclose and report » avec GRI et ISSB, alors qu'ils proposent aussi qqch sur la première étape...

Questions:

- Question sur EFRAG : est-ce que vous vous adaptez à eux, sur l'eau, ils ont développé une annexe sur le sujet.
- Au final, rien sur valuation, mais sur la mesure de la qualité de l'eau par exemple.

Nadine McCormick demande au public de citer les cinq grandes pressions sur l'environnement (réponse fébrile)

Commence réellement le *how*

1. Materiality

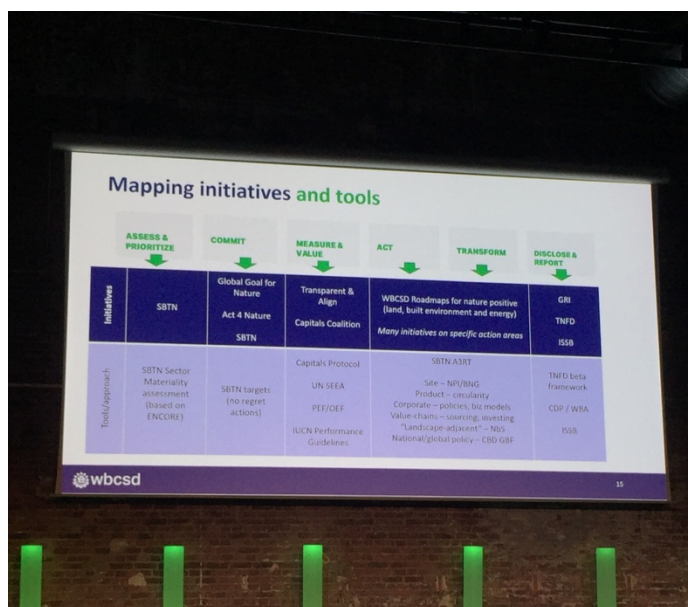
ENCORE tool

—> “materiality assessment to identify risk and opportunities”

“Systemic risk: a new type of risk; is the company still gonna exist in ten years?”

Présentation d'un « success story case »

Stora Enso (forest) —> décrit les phases qu'ils ont suivi



Pierre-Alexandre Bapst (Hermes International)

(ils voulaient éviter, selon Bart Corijn, organisateur de la session une compagnie food/agriculture, et cela n'a pas été simple de trouver qqn en dehors.)

Il parle sans interaction, un texte qu'il a déjà dû dire à d'autres occasions

—> But : qui nous montrer comment ça marche « concrètement » de faire la journey

« A Journey » ; il nous décrit les étapes, « a mouvement »

« Tout le monde commence avec une approche fragmentée, puis on s'améliore, mais il faut continuer malgré les erreurs, etc »

« We are good, but we want to be even better »

« What counts is not the measure; it is how we got the measure »



—> Conclusion de Pierre-Alexandre Bapst // Nadine McCormick prend aussi une photo de ce slide.

« It is a people-based activity, I don't believe in « expert systems »***

Message un peu à contre-courant : indique que tout ne sera pas forcément comme prévu en 2050, que c'est compliqué. « we need to be very conscious about what we promise » (tranche un peu avec le "positive")

Question du modérateur pour Nadine: how do you feel with this practice from the perspective of your theory?

—> Car en effet, aucun des outils présentés par Nadine n'est utilisé par Hermes.

Question (comme très, très souvent) sur la gouvernance de tout ça (implication des employés, etc).

Question précise sur le conflit entre qualité eau (installation d'une centrale qui demande plus d'énergie) et objectifs sur climat - comment gérer ce conflit ?

Nadine: « You say conflict, I say trade-off » (et s'en sort comme ça...)

Fin 13:34 - Lunch - petit sandwich – (moins bien qu'à Madrid !)

Reprise 14h34

Appendix 6: Example of interview grid – ISO expert

A. Starting questions

1. What are your training and professional background?
2. What are you doing besides ISO?
3. How did you come to provide expertise for ISO?

B. ISO 14008 & 1007 origins (agenda setting)

4. From where (by whom) did the new item agenda come?
5. What was the main argument and debate regarding the scope of the standards? (Have some companies ask for it. If yes, can you tell me which ones?)
6. Were the key stakeholders supporting the new item agenda significantly different from the usual membership of the working groups related to 14000 standards in the ISO TC207/SC1 - if yes, why / how?

C. Standard development / Participants / Expertise

7. What was your role in the development of ISO 14008 as the “convener”?
8. What was the role of the different participants (who are they?)
 - 8.1 Participation of Audit and Accounting firms? (Big 4)
 - 8.2 Participation of Natural Capital Coalition actors? True Price or Trucost?
 - 8.3 Other MNCs?
 - 8.4 NGOs? (WBCSD)
 - 8.5 States?
 - 8.6 The UN/World Bank (e.g., Wealth Accounting and Valuation of Ecosystem Services)
 - 8.7 IPBES members/stakeholders?
9. Technical development – which previous study/report has most inspired/influenced your work for ISO 14008?
 - 9.1 Which field (discipline) has most influenced your work
 - 9.2 Which concepts/notions (natural capital, ecosystem services, externality)
10. What was the most significant challenge in the ISO 14008 development?
11. Will this standard be supplemented by further technical recommendations?

D. Expected significance of ISO 14008

12. Was there a debate regarding the decision to make ISO 14008 a ‘requirement standard’, in accordance with ISO’s neutrality principle, i.e. not only for the purpose of conformity assessment?
13. Which link with other ISO standards? Is it a new domain/approach to what already exists in environmental risk management and existing standards?
14. What is the market?
 - 14.1 How do you think the standard will be used?
15. Who is the target audience?

E. Conclusion

16. What do you personally think of this standard?
17. According to you, monetising environmental impact (nature in general) will soon be “mainstream”? Why? In what form and with what consequences?
18. Are new standards related to this one already in development?
19. Which other interlocutors would you recommend meeting?

