

## **Environmental accounting in the *European Accounting Review*: a reflection**

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### **Abstract**

We reflect upon how *European Accounting Review* has conceived of environmental accounting (and to some extent social/sustainability accounting work) over its 30-year history, with the aim of discussing ways in which environmental accounting research can further develop, both within and beyond this journal. After outlining the broader social and ecological context from which environmental accounting has emerged (and noting that this context is evolving in substantive ways), we provide an overview of the types of research published in *EAR*. We combine these elements to identify three themes that we argue are critical for the direction of future research: the financial materiality of ecological issues and the impact this has on risk; how environmental accounting practices are constructed; and how a new relationship between nature and society may affect accounting practices. We finally conclude by envisioning a future of environmental accounting research that dovetails with the sustainability ambitions that can be drawn from an examination of the detailed targets that underpin the Sustainable Development Goals.

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## 1. Introduction

Broadly speaking, environmental accounting encompasses processes and practices that attempt to address and minimize impacts of organizations on the natural environment. This is a large field of endeavor that will not be synthesized in this paper (but see Bebbington et al. 2021; Laine, Tregidga & Unerman, 2022). Rather, the aim of this paper is to review work that has been published in *European Accounting Review* (hereafter *EAR*) over its 30-year history with the aim of exploring how this journal has conceived of environmental accounting (and to some extent social/sustainability accounting work). Reflecting upon what we know collectively of the wider field, we will highlight possible ways in which environmental accounting research efforts can be further developed (drawing from but not limited to *EAR* papers).

To achieve this aim, we undertake three steps which are reflected in the structure of the paper. First, we outline the broader social and ecological context from which environmental accounting has emerged and describe how this context is evolving. It is our contention that the evolving context requires that environmental accounting is designed and developed so that it is ‘fit for purpose’. We argue that we need the mobilization of financial markets for a just and sustainable transition, rather than conceiving environmental accounting as (just) serving the needs of financial markets. This may require rethinking notions of risks and materiality as well as the provision of information from corporations such that it can support financial market transformation and wider accountability demands.

Second, we summarize the topic areas that papers published in *EAR* focus on (e.g., financial reporting, non-financial reporting, management accounting, audit/assurance,

measurement) in combination with their conceptualization of who environmental accounting is for (e.g., for society or for capital market participants) and provide some context to this publication pattern. Third, combining our reflection on the evolving context with the review of published papers, we identify three themes which accounting scholarship could further consider, namely: the convergence between environmental issues and financial markets is leading researchers to enquire into the financial materiality of ecological issues (i.e., ‘nature’ as a risk factor); the problematization of environmental accounting in action delves into how environmental accounting practices are constructed (i.e., the environment in accounting change); and the idea of the Anthropocene<sup>1</sup> raises the question of the nature of the paradigmatic change that is necessary in accounting to cope with a new relationship between nature and society (i.e., environmental accounting in a changing world).

Since the publication of the *Brundtland Report* in 1987, the concept of sustainable development created a new conceptual framing for navigating the tensions between environment and economic development. Sustainable development entered the language, agendas and work plans of intergovernmental bodies; governments (both national and regional); cities and settlements; and corporations. Corporations are considered to have a role as partners in the pursuit of sustainable development, as they have a substantial direct effect on sustainability concerns such as natural resource consumption, pollution effects, biodiversity impacts, possibilities for realizing human rights, and the potential for corruption to take hold (Österblom et al. 2022).<sup>2</sup> Recently,

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<sup>1</sup> In brief, the Anthropocene is a term used to describe how human activities are the key driver of global environmental change, operating as a geological shaping force for the earth system. This is a substantive change in understanding of the impacts of human activities and introduces new understanding of the history of the planet.

<sup>2</sup> A desire to elicit corporate support for sustainable development led to the creation of the United Nations Global Compact that defines a set of environmental, social, and ethical principles to which thousands of

inter-governmental sustainable development initiatives have started shaping corporate agendas for action and impact. While the Millennium Development Goals (2000 – 2015) did not place corporate action at its core, the Sustainable Development Goals (SDGs) have a clearer enabling role for corporations (Bebbington and Unerman, 2018)<sup>3</sup>: they articulate the global vision for sustainable development through a series of targeted outcomes and actions that are themselves conditioned by economic systems that also shape corporate sustainable development ambitions. Given that environmental accounting research and practice have co-evolved alongside the evolution of sustainable development policy and consider both organizational and shareholder/stakeholder actions, we will return to the SDGs and their targets at the close of the paper to present a vision for the future development of environmental accounting research, noting that this is an “area of human endeavour that is likely to have profound consequences for the human race” (Hopwood, 2009, p.439).

## **2. Context setting**

Human flourishing has co-evolved within the Earth system which is itself made up of four interlocking sub-elements: the geosphere, biosphere, hydrosphere and atmosphere. These spheres (in combination) create the conditions within which human communities might flourish and equally where organisations undertake their activities. It is this ‘operating space’ that has evolved significantly over the last 70 years as well as, critically, over the last 30 years during which *EAR* has existed. Indeed, ‘modern’

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companies have committed. Corporations have also engaged with a myriad of sector and country specific corporate sustainability initiatives of varying degrees of formality. Many of these initiatives have yet to be examined in the accounting literature, with the notable exception of the Equator Principles (O’Sullivan and O’Dwyer, 2015).

<sup>3</sup> Perhaps most explicitly in SDG 8 (Decent Work and Economic Growth); SDG 9 (Industry, Innovation and Infrastructure); and SDG 12 (Responsible Consumption and Production) with collaboration across the whole of society (including organisations) being essential for the realization of many more. The SDGs, however, did not mark the first time accounting has considered sustainable development concerns.

environmental concerns are most usually dated to the time of the ‘great acceleration’ after the Second World War where combined human and corporate actions resulted in an uptick of material mobilization and pollution effects (Steffen et al. 2004). This is also the time when the globalized economy emerged alongside a particular transnational corporate form (Österblom et al. 2022) that has been incentivized to focus on maximization of throughput (and impacts). This system is underpinned by an assumption of continued economic growth with externalities being (seemingly) accepted as a persistent unaddressed feature of the system (Unerman et al. 2018). These assumptions are problematic, especially as the nature of environmental change has evolved. Specifically, concerns over local environmental effects have been replaced by a realization that we are living in the Anthropocene (Bebbington et al. 2020a; Bebbington & Rubin, 2022) and that planetary boundaries (Rockström et al. 2009) are being crossed such that ongoing resilience and productivity of the natural system is uncertain (Nyström et al. 2019; Folke et al. 2021).

Concerns about the natural environment that were present in the second half of the 20<sup>th</sup> century did not immediately find resonance in accounting practice and scholarship, at least in part because of accounting’s focus on organisations rather than economic systems. At the same time, the conception of what was the appropriate focus of accounting research was constrained at this time to more practice based and technical matters. It was not until the 1970s that a wider view of accounting emerged (Burchell et al. 1980), and it then took until the 1990s for environmental accounting to emerge (Gray 1990, 1992; Bebbington, 2021): environmentally infused accounting has existed since *EAR*’s founding. Environmental accounting, however, did not emerge from a vacuum. Rather, a rich research tradition that expanded perceptions of accounting beyond the technical and considers social and environmental effects (and their interactions) is also

represented within *EAR* and we will draw from this work to supplement our observations.

Not least, the policy and practice context in which accounting scholars develop their insights is currently changing. First, the rate and degree of environmental change are now such that concerns are being expressed that tipping points are being approached in the earth system. This means that the salience and materiality of environmental matters will likely increase rapidly as well. This also points towards understanding environmental risk as a systemic risk to the resilience of the economic system, something that is recognized (for example) by the Financial Stability Board's development of the Taskforce on Climate-related Financial Disclosures. Second, there has been a proliferation of literature that moves beyond concerns about 'the environment' in general to being concerned with specific aspects of the environment such as climate change, water and biodiversity (each of which have their own particular dynamics). This increases the range of issues over which accounting scholars might be engaged and the depth with which each biophysical area can be examined. This also opens up the possibilities (not yet realized as far as we can tell) for work on intersections between these elements to emerge (e.g., the climate-biodiversity nexus). Third, in the policy context, although the Sustainable Development Goals are high level ambitions, they are underpinned by 169 targets that are more specific about actions and goal achievement (including targets that focus on organisations and enrol accounting mechanism for their achievement). Fourth, in the regulatory context, with the European Union at the vanguard, different legislative actions rest on accounting technologies, most directly in the obligation for organisations to provide information about environmental/sustainability aspects, and more indirectly in plans for corporate sustainability due diligence or the EU Action Plan on Sustainable Finance. Finally,

there are emerging links between accounting scholars and colleagues working in other business and management disciplines with finance being perhaps the most generative subject area (noting that financial organizations are subject to disclosure requirements alongside accounting regulation). Taken together, these elements suggest that environmental accounting might be on the cusp of a step change: this is a theme we will return to later in the paper. For now, however, the paper now moves to describe the papers that have been published in *EAR* in the last 30 years.

### **3. (Social and) environmental accounting research in EAR**

#### *Overview*

During the period 1992-2021, 40 environmental accounting papers were published in *EAR* (see Table 1): we took a very inclusive approach to including papers in the ambit of this review. In addition to these 40 papers, and in the form of a book review, Gray and Stone (1994) wrote an essay focusing on the state of environmental accounting and auditing in Europe drawing on a survey of European professional accountancy bodies in the sphere of environmental accounting and auditing. In this paper Gray and Stone (1994) highlight that the accountancy profession failed in the 1970s to make much progress in the areas of corporate social responsibility and social accounting, even though there were active initiatives and committee work sponsored by several key accountancy institutions at this time (Bebbington, 2021). Gray and Stone (1994) focused on the profession because they thought that accounting research would follow the lead of professional bodies as well as viewing accounting practice being co-determined by the profession. Gray and Stone (1994) were concerned that if the profession failed to address environmental matters consistently and rigorously in the near term environmental accounting would not be seen as ‘mainstream’. At the same time, environmental accounting was resisted by the ‘critical accounting’ movement as being too closely associated with corporate agendas

(most clearly by Tinker et al. 1991 – see also Gray 1992 and 2002 for a consideration of these tensions). In combination, these factors may have limited both the demand for and supply of environmental accounting scholarship, leading to a slow take up of research on environmental matters. One way to address this kind of blockage (and evident within *EAR*) is to sponsor special issues to encourage academic work. The outcomes of this process underpinned the early contributions made in *EAR*, specifically the special issue on environmental and social accounting in Europe published in 2000 (containing eight papers) and a special section on accounting and the market of emissions published in 2008 (containing three papers).

**Table 1. Environmental accounting papers published in *EAR* (1992-2021) (n = 40)**

<b>Authors</b>	<b>Year</b>	<b>Topic/approach</b>
Blokdiijk & Drieënhuizen	1992	Assurance
Adams & Kuasirikun	2000 (*)	Non-financial reporting
Bartolomeo et al.,	2000 (*)	Management Accounting
Bebbington et al.,	2000 (*)	Editorial
Bouma & Kamp-Roelands	2000 (*)	Management Accounting
Capron & Gray	2000 (*)	Conceptual
Collison & Slomp	2000 (*)	Assurance
Moneva & Llana	2000 (*)	Non-financial reporting
Owen et al.,	2000 (*)	Assurance
Larrinaga et al.,	2002	Financial Reporting
Antheaume	2004	Management Accounting
Cormier et al.,	2005	Non-financial reporting
Hassel et al.,	2005	Measurement
O'Dwyer et al.,	2005	Non-financial reporting
Owen	2005	Viewpoint
Bebbington & Larrinaga	2008 (*)	Financial Reporting
Holm & Rikhardsson	2008	Non-financial reporting



Johnston et al.,	2008 (*)	Financial Reporting
Kolk et al.,	2008 (*)	Non-financial reporting
Camara et al.,	2009	Non-financial reporting
Cho	2009	Non-financial reporting
Johansen	2010	Non-financial reporting
Laine	2010	Non-financial reporting
Henri et al.,	2014	Management Accounting
Clarkson et al.,	2015	Financial Reporting
Cahah et al.,	2016	Non-financial reporting
Gao et al.,	2016	Non-financial reporting
Lu et al.,	2017	Non-financial reporting
Hall & Millo	2018	Measurement
Reimsbach et al.,	2018	Assurance /Non-financial Reporting
Michelon et al.,	2019	Assurance
Schiemann & Sakhel	2019	Non-financial reporting
Stenimeier & Stich	2019	Assurance
Caglio et al.,	2020	Assurance /Non-financial Reporting
Cannon et al.,	2020	Non-financial reporting
Clune & O'Dwyer	2020	Non-financial reporting
Wang et al.,	2020	Non-financial reporting
Gómez-Carrasco	2021	Non-financial reporting
Hoang & Phang	2021	Assurance
Mittelbach-Hörmanseder et al.,	2021	Non-financial reporting

(\*) Special issue/section

Outside of these special issues/sections, other environmental accounting contributions also exist and we identified 12 papers published in regular issues between *EAR*'s founding date and 2011 (a 20 year period). This is a relatively small number given the salience of environmental matters over this time, although at the same time it is reflective of how environmental accounting was still a fairly small and specialised area within accounting

research at the time (Owen, 2008; Gray, 2010). Indeed, Bebbington et al. (2000) noted that their special issue only received a limited number of submissions despite what they saw as a growing interest in social and environmental accounting and reporting questions within the business practice together with developments in regulation in this area. A relative concentration of work from the United Kingdom and other English-speaking countries was also noted as a concern, something that has been remedied since that time. Bebbington et al. (2000) also argued that the field would benefit from specialized research meetings and conferences, as this would help academic networks to develop and be useful in finding support for emerging scholars aspiring to publish their work in the area. Subsequently, the success of both the Centre for Social and Environmental Accounting Research (CSEAR) and the Environmental and Sustainability Management Accounting Network (EMAN) have underscored the importance of institutions and scholarly networks for encouraging work in less traditional accounting topic areas (see Baker et al. 2023; Rodrigue and Tregidga, 2020). Since 2014, *EAR* has often published around two or three environmental accounting papers each year. Given the growth of interest in environmental, sustainability and ESG (environment, social and governance) matters in accounting academia in recent years, this indicates that *EAR* may not have been the outlet of choice for researchers in the area.

The relatively low number of environmental accounting papers needs more explanation as it is surprising given *EAR*'s openness to all research topics, approaches and methods (see Loft et al. 2002). We suspect that the small size and marginal position of the environmental accounting community affected how researchers picked the outlets they targeted. Journals such as *Accounting, Auditing and Accountability Journal*, *Critical Perspectives on Accounting* and *Accounting Forum* may have been preferred, not only because these outlets had already published a body of environmental accounting research,

but also because these journals had Editors and Editorial board members who worked in the field (the competition for ‘good’ journal submissions is fierce and editors of these journals would have been seeking environmental accounting papers). This type of a reputation may have a lasting effect, as scholars continue to turn to journals in which a lively discussion of environmental accounting is on-going. Moreover, *EAR* (in common with *Accounting and Business Research*)<sup>4</sup> seeks to publish paper across all accounting sub-fields. Again, and in the presence of what are perceived as more ‘specialist’ journals, environmental accounting scholars might consider *EAR* a less obvious outlet for their work.

Additional analysis of the papers that were published in *EAR*<sup>5</sup> uncovers that environmental accounting papers are part of the cohort of highly cited *EAR* papers. For example, an analysis (drawing from Scopus) of 1,094 outputs in *EAR* from 1992-2021 identifies that 12 of the 40 environmental accounting papers are among the 50 most highly cited papers during that period. In addition, where an issue has an environmental accounting paper (n=16) it is the first or second most cited paper in 12 of those issues. While comparison of and understanding of citation patterns is fraught with difficulty (and not amenable to comparison between journals), this analysis suggests that environmental accounting publications in *EAR* are among the most cited produced by the journal.

We now move to a review of the contents of the papers identified. In developing our literature review we adopted several approaches to understand the distribution and nature of the papers identified in the sample. In the first instance we classified papers in terms of their focus on accounting aspects (e.g., financial reporting, non-financial reporting,

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<sup>4</sup> We also conducted an analysis of environmental accounting papers in *Accounting and Business Research* over the same time period used in this paper and found 24 papers and patterns of topic coverage that were similar to what is found in *EAR*. This leads us to be more confident of the points we make here.

<sup>5</sup> We are indebted to Beatriz Garcia Osma for prompting and undertaking this analysis.

management accounting, audit/assurance, measurement), as well as on the topic area considered (carbon, diversity, employees, etc.). As is evident from Table 1, most papers focused on non-financial reporting and assurance (28 papers), four papers on management accounting, three papers on financial reporting and two papers on measurement issues (the final three papers were one editorial, one viewpoint and a conceptual paper). In terms of issue coverage only six of the papers focused on a particular environmental issue area, while most papers referred to umbrella constructs like corporate social responsibility, sustainability, social, and/or environmental reporting. In addition, the initial review considered what actors were the subject of papers (e.g., corporation, managers, investors, auditors, stakeholders). This categorisation did not distinguish *EAR* papers from each other because papers either did not specify an actor target or focused on more than one actor cohort. This led us to consider the papers in terms of the (often implicit) assumption in each paper about who social and environmental accounting is for, and specifically, whether it is conceptualized as being for society or for capital market participants.

#### *Assurance and non-financial reporting*

Drawing from Table 1, we observed uneven attention being paid to environmental accounting issues with non-financial reporting and assurance papers being especially prominent. Several observations arise in this context. First, in earlier publications research and practice were more intertwined, especially in audit. We suggest that as more academic papers emerge on a topic area, explicit links to practice are likely to decline as there is more of a prior literature to base new work upon and practice innovation is no longer a complete rationale for studies. An early example of this work includes Blokdijsk and Drieënhuizen (1992) who posed questions as to if environmental auditing is the domain of an independent auditor, whether a financial auditor can issue an opinion on an environmental report and explore the contribution of auditors to “controlling and solving

environmental problems” (p.438). The paper advances normative arguments about the need to account and report “for the damage a company causes to the environment during the year”, to give a ‘fair view’ of the company financial position and make managers and investors “more than a little concerned about the continuity of their business” (p.441). This focus on business continuity and stability is only now being rekindled with the likes of the Taskforce on Climate-related Financial Disclosure (TCFD). Another illustrative example of strong ties between research and practice is the paper by Collison and Slomp (2000), offering an academic-practice hybrid view on the role of the Fédération des Experts Comptables Européens (FEE as was, now Accountancy Europe) in the environmental agenda. Finally, with a more critical approach, Owen et al. (2000) reflects upon the fundamental values for social audits vis a vis the risk that (without appropriate corporate governance structures in place) the practice is captured by consultants and managers.

Second, up to 2010 the focus of non-financial reporting studies was very much on reporting practice itself (e.g., Adams & Kuasirikun, 2000; Moneva & Llana, 2000; Camara et al. 2009), reflecting an interest in understanding the factors driving voluntary disclosures of social and environmental issues (e.g., Cormier et al. 2005; Kolk et al. 2008); and exploring the presence (or absence) of stakeholder involvement and planetary concerns in non-financial reporting (O’Dwyer et al. 2005; Johansen, 2010; Laine, 2010). The recent findings by Gomez-Carrasco et al. (2021) on the on-going dialogue on Twitter between companies and stakeholders also reflects this strand of work, and highlights a mismatch between what firms communicate about and what stakeholders are interested in. The key take-away from this strand of literature is that while voluntary social and environmental reporting practices have the potential for discharging accountability for social and environmental impacts, they are often perceived in the literature as being used

for legitimacy purposes (e.g., Cho, 2009). That being said, the label of ‘legitimation’ is a problematic one. For example, responding to stakeholder pressure and addressing problems is one of the possible legitimation responses and one that we might approve of. It may be that different language and analysis would support more nuanced conclusions in this area. At the same time, papers also noted that some disclosure is aimed at improving investor-focused information (Cormier et al. 2005; Holm & Rikhardsson, 2008; Kolk et al. 2008).

The above observation leads to our third point. That there has been consistent interest in the role of non-financial reporting for capital market participants (e.g., Cahan et al. 2016; Gao et al. 2016; Lu et al. 2017; Schiemann & Sakhel, 2019; Cannon et al. 2020; Mittelbach-Hörmanseder et al. 2021) with this strand of work increasing after 2015.

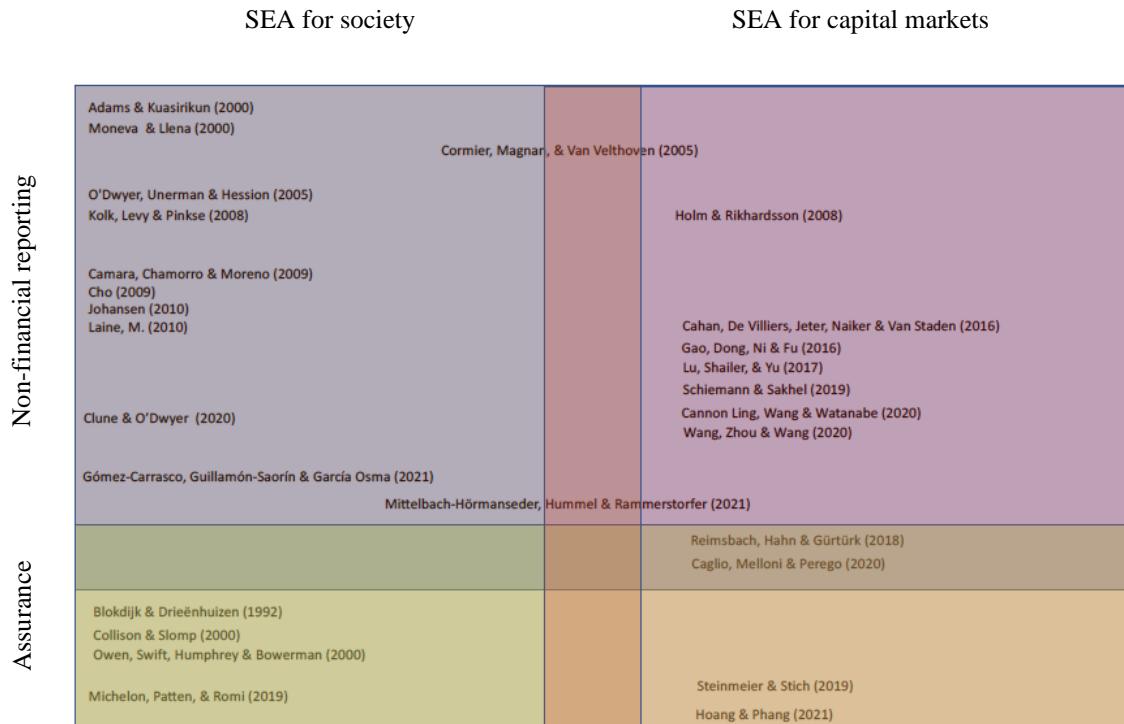
Without claiming any causality, we note that since 2015 there was renewed regulatory interest in key planetary challenges such as climate change (i.e., Paris Agreement) and sustainable development (i.e., the release of the United Nations’ Sustainable Development Goals). It was also the year that the Financial Stability Board established the TCFD, an initiative that we noted seeks to create more robust and enduring connections between information provision and financial markets participants’ needs. In this strand of research, Schiemann and Sakhel (2019) provide some novelty as it considers the environment as a dependency (e.g., O’Dwyer & Unerman, 2020) by focusing specifically on physical risks reporting.

Fourth, an additional stream of research focuses on the adoption of ‘integrated’ reporting practices (Reimsbach et al. 2018; Caglio et al. 2020; Wang et al. 2020; Hoang & Phang, 2021) and this is an area where conflicting results emerge. For example, Caglio et al. (2020) and Wang et al. (2020) highlight the positive capital market effects of integrating sustainability information with financial information and how these

effects are stronger when matched with credibility-enhancing governance mechanisms. This stands in contrast to Reimsbach et al.'s (2018) experimental approach which suggests that assurance of integrated information (vis a vis assurance of separate sustainability information) is less effective in enhancing investors' evaluation of a firm's sustainability performance. Moreover, Hoang and Phang's (2021) experiment suggests assurance plays a more significant role in investors' willingness to invest when there are high reliability risks. Another two more papers provide contrasting evidence on the role of assurance for the credibility of sustainability information. Steinmeier and Stich (2019) provide evidence that sustainability assurance is positively associated with efficiency in sustainability investment, hence suggesting that it improves managerial decision making. In contrast, Michelon et al. (2019) find that sustainability assurance is associated with an increased likelihood of (sustainability) restatements and ascribe this puzzling result, in stark contrast with the financial auditing literature, to providers using restatements to legitimise their work to maintain and expand their presence in a growing market (this paper also notes potential differences in assurance practices between accounting and consulting firm providers).

A final point to consider from this categorisation of papers is that although the society vs. capital market dichotomy may correlate with interpretive vs. positivist papers, in the case of *EAR* there are positivist papers that embrace a view of social and environmental accounting for society (e.g., Moneva & Llana, 2000; Cormier et al. 2005; Michelon et al. 2019; Gomez-Carrasco et al. 2021), highlighting the inclusive and diverse nature of accounting research in Europe. Figure 1 maps the papers discussed in terms of the 'for society' and 'for capital markets' dichotomy for the papers that focus on non-financial reporting and auditing.

**Figure 1. A map of EAR publications on non-financial reporting and auditing**



*Financial reporting and measurement*

The contribution of *EAR* to social and environmental accounting is also important when it comes to exploring how (social and) environmental issues feed into financial reporting processes and decisions: a topic that is likely to become central to future research as it is currently being widely discussed at policy and regulatory levels. Larrinaga et al. (2002) and Bebbington and Larrinaga (2008) both embrace the view that environmental accounting is seen as a way of discharging accountability towards stakeholders, drawing from Owen et al. (1997)'s arguments that technical arrangements (voluntary reporting standards) without institutional reform (mandatory reporting requirements) are unable to empower accountability relationships and stakeholders. Larrinaga et al. (2002) analyse the effectiveness of Spanish environmental accounting regulation in prompting reporting while Bebbington and Larrinaga (2008) analyse the problems associated with the valuation of emission allowances (in the special section on this topic). Within this same



section, Johnston et al. (2008) show that the capital market positively values SO<sub>2</sub> emission allowances of a sample of US electric utilities, whereas Clarkson et al. (2015) provide evidence that carbon allowances are not value-relevant unless there is an allocation shortfall, in which case they are negatively associated with firm valuation. They also find that this negative association is mitigated when firms have relatively better carbon performance than their industry peers. This finding is consistent with Hassel et al. (2005) who found similar evidence in a sample of Swedish companies. As this later paper employs environmental performance (e.g., ratings) rather than disclosure in investigating value relevance, we classify this paper as a ‘measurement’ paper in that ratings are used to attempt to assign a financial value to firms’ environmental performance. There was one other measurement paper in *EAR* which examined the issue of performance measures to explain public policy in the non-profit sector (Hall & Millo, 2018).

### *Management Accounting*

Within the 30-year period we focused on, we could only identify four papers (all published early in the period) that investigated environmental accounting for internal decision-making. This is a low number, especially when we consider the long European tradition of management accounting research as well as the importance given to exploring accounting as a social and institutional practice (Hopwood, 2008): we will return to this observation at the close of the paper. In this category, Bartolomeo et al. (2000) examined environment-focused financial and non-financial information in a range of companies in four countries, namely: Germany, Italy, the Netherlands and the United Kingdom. Drawing on an interview-based survey, they found that there were considerable variations in environmental management accounting practices, and for many of the companies these activities tended to be more like experimental projects rather than being integrated into core management processes. Furthermore, Bartolomeo et al. (2000) highlight that at the

time of their data collection (the late 1990s) environmental management accounting practices were run by environmental and operational managers, while the accounting function remained side-lined. In the same special issue, Bouma and Kamp-Roelands (2000) investigated how environmental management information systems are designed, focusing on a case study company. In their work they highlighted how the various internal and external stakeholders had different expectations and needs concerning the environmental management information systems and concluded that one of the key elements for satisfying the various user needs is ensuring that the environmental information produced is of 'good' quality. Taken together, this suggests that the predominant focus in *EAR* on external reporting may be to the detriment of understanding internal processes that are shaping organizational action.

Taking a different tack, Antheaume (2004) presented an experimental account of externalities using full cost accounting. By focusing on an industrial process, the study highlights how the varying assumptions and methods used in three external cost evaluation approaches led to significantly different full cost accounting calculations. While Antheaume (2004) emphasizes the importance of including the externalities in assessments and accounting calculations of organizational activities, the range of values generated by these techniques suggests that challenges will arise in implementing figures that are comparable across cases.

More recently, Henri and colleagues (2014) examined whether and how firms are tracking environmental costs in their cost accounting systems and how this affects the economic and environmental performance data. Based on survey data, they highlight that tracking environmental costs is strongly related to the environmental performance of the firm and has an indirect influence on economic performance. In other words, for certain firms there are both environmental and economic benefits to be gained if the cost accounting system

is designed and used to track environmental costs, although at times the additional effort and increased costs required for developing the system may outweigh the potential economic benefits. Like Bartolomeo et al. (2000), Henri et al. (2014) also note that practices vary and that while some firms might engage in tracking environmental costs, they seldom do so in a very in-depth manner, clearly highlighting potential to develop such practices further.

### *Other papers*

Two further papers complete the overview of *EAR* publications on environmental accounting. First, Capron and Gray (2000) discuss an initiative in which a group of managers working for social economy firms in France sought to develop new ways to articulate and account for the social responsibility of organisations. The accounts and the related processes were observed to be useful for both internal and external stakeholders. While this paper is limited in detail, it is intriguing in the sense that it has links to several current conversations within the accounting literature. For example, the initiative draws on Boltanski and Thévenot's (1991) theoretical thinking regarding economies of worth and logics of justification, which at the time was only available in French and hence not widely known in the Anglo-American literature. The evaluation of the initiative also has clear links to ideas about dialogic engagement (see Dillard & Vinnari, 2019). Further, Capron and Gray (2000) note how the case illustrates a need to discuss how academics both maintain their commitment to scholarship while also influencing action, suggesting that there is a tension between these goals (see also Lukka & Becker, 2022; Correa et al. 2023). Finally, Owen (2005) also has resonance with these observations. Owen (2005) observes how in the early 2000s (following the accounting scandals of Enron and other major corporations) there was significant growth in the number of corporate social responsibility and sustainability reports produced by firms. In this viewpoint, Owen

(2005) expresses concerns that such reports did not seem to be driven by a need to discharge accountability, but instead questions of reputation, risk management and competitive advantage had become prevalent. To counter this development, Owen (2005) proceeds to challenge the accounting academics, who in his view should pursue a strategy of critical engagement. He argued that this would entail making changes to how business and accounting education prioritizes self-interest over community values and ethics, as well as pursuing research that would explore and discuss potential social, environmental and ethical conflicts in societies. At the same time, Owen (2005) acknowledges how the developing academic environment, including journal requirements and institutional expectations set by universities, can set challenges for scholars and thereby discourage them from embarking on any critical engagement endeavours he would perceive to be important (see also Gendron, 2008).

This brings us to the close of the outline description of the work that has been published in *EAR* from 1992 to 2021. At the time of writing, we note that there are ten further environmental accounting papers available in the journal (published in 2022 or forthcoming): this suggests a greater prevalence of environmental accounting work in *EAR* going forward. We reviewed these papers and note that these follow the broad trends that have already been identified in this section. At the same time, these papers more often use an ESG framing which reflects the popularity of this language at the current point in time<sup>6</sup>. We have used these papers (and others) in the remainder of this paper as we seek to synthesize this work.

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<sup>6</sup> For a discussion of various nuances for ‘ESG,’ ‘CSR,’ and ‘sustainability,’ see Sellhorn and Wagner (2022).

#### **4. Discussion: synthesizing the literature**

This section is focused on proposing ways to develop further research in environmental accounting by setting the body of research published in *EAR* into a broader context. In particular, three trajectories emerge from our literature review: the growing presence of financial markets in (generally positivistic) studies about environmental accounting; a steady flow of studies and problematizations of environmental accounting in action (often from a normative or critical perspective); and a consideration of topics that are not (yet) present in *EAR* but which are likely to develop in the future.

##### *Environment as financial risk*

There are several reasons why there is a convergence between environmental issues and financial markets. On the one hand, investors are starting to realize that changing environmental conditions (notably climate change and more recently biodiversity) are financially material. Institutions such as the Financial Stability Board have increasingly made this point to prompt investors to look more broadly than financial returns. Indeed, policymakers have come to believe that capital markets need to be (and can be) mobilized to make sustainability ‘work’. A notable example is the European Commission’s (2019) Green Deal, which seeks to “direct private capital towards climate and environmental action, while avoiding lock-in into unsustainable practices” (p.2), something that requires building a ‘coherent financial system’ and this institutional entrepreneurship is mirrored in other jurisdictions.

A substantial part of the literature reviewed reflects this framing and explores the value of CSR (e.g., Gao et al. 2016), carbon disclosure (e.g., Schiemann & Sakhel, 2019) and assurance (e.g., Caglio et al. 2020), thereby implying that enhanced disclosure quality reduces information asymmetry and agency conflicts (Leuz & Verrecchia, 2000; Healy and Palepu, 2001). Interest in the role of environmental information in capital market

research (with a focus on the financial materiality of environmental information) has been more frequent since the recent emergence of CSR reporting in North American accounting journals (see Roberts, 2018 and Gray, 2006 for critiques of this trend). Undoubtedly, financial and capital markets are, for better or worse, central in our current capitalist economic system in the short-term even if they struggle to contribute holistically to sustainability currently (Jouffray et al. 2019). In addition, it is unclear if we have the appropriate instruments to understand how environmental accounting interacts in this process. For example, it is questionable whether the notion of information asymmetry exhausts the environmental problematic (that is, with more information unsustainability would be addressed). Moreover, Mol (2006) makes a similar observation about the limits of informational governance: that is, the expectation that mandatory disclosure requirements will result in organisational change and reduced environmental impacts. We would rather argue that there is often a complete lack of knowledge about environmental problems (Folke et al. 2021) or even blindness to what are salient environmental issues (March 2006; Alvesson & Spicer, 2012; Essén et al. 2021): this is a distinctly different problem than information asymmetry. Bebbington et al. (2020b) provide a case in point to that effect, illustrating how the oil and gas industry consistently values fossil fuel reserves positively, despite information indicating that the exploitation of those reserves would lead to carbon emissions that are beyond the inter-governmental plans for emissions reductions and the earth system's capacity to function as it currently does. This reflects an accounting decision that ignores the externalities caused, or at least is unable to articulate a timely sense of the value relevance of that externality. This also misjudges the resilience of our planetary system beyond the tipping points and the likelihood that regulation will enforce a reduction in fossil fuel valuation.

Furthermore, deeply ingrained in the financial materiality of environmental information is the notion of risk (e.g., the risks and opportunities of climate change and associated policies and technologies to which TCFD refers – see Schiemann and Sakhel, 2019). However, instead of focusing on risk, it should be realised that environmental challenges are also characterized by uncertainty and surprise, feedback loops, and tipping points in non-linear complex socio-ecological systems. These effects are amplified by actions that have simplified and reduced the resilience of ecosystems (Nyström et al. 2019; Folke et al. 2021). In any case, while risk assessment involves a knowledge of the distribution of potential gains and losses, uncertainty is characterised by unknowns, with the potential forthcoming pathways, outcomes and their associated likelihoods being hard to identify. Such lack of visibility poses challenges to organisations and financial markets, as it limits the possibilities of using mathematical models and probability distributions in estimating potential scenarios (Bebbington & Larrinaga, 2008). This distinction has not, as far as we know, been addressed by capital market studies of environmental accounting. Indeed, Stern (2006) argued that the methods of conventional economics are not suited for the analysis of uncertainty. We would extend this conclusion to accounting studies and ask: what kind of capital market research could deal with uncertainty? It is worth admitting that we are uncertain about the answer to this question. One potential avenue to approach uncertainty, however, could however be using climate scenarios by organisations to articulate the financial risks and opportunities of climate change. Presently, little is known about how companies create and develop these scenarios, what type of expertise they make use of while developing them, what role external consultants and professional services play in the process, as well as the ways scenarios are made use of internally. Likewise, qualitative work focusing on how investors perceive scenarios, what is expected to arise

from scenario disclosures, as well as whether and how investors make use of such information could be helpful for building the knowledge base on which capital market research regarding uncertainty could be developed.

A different angle to approach environmental information is through the notion of externality, i.e., an (environmental) cost imposed on a third party by an economic agent (Unerman et al. 2018). Some of the most pressing ecological challenges have the characteristics of an externality and often require actions beyond the curtailment of information asymmetries to be internalized. In this context, the European Union has conceived of accounting as an instrument to enable and facilitate the mobilization of financial markets for sustainability (Hopwood, 1994). This perspective, however, has seldom been visible in *EAR* (except for Antheaume, 2004) and also represents a potential avenue of research that could be studied in more depth, perhaps using Antheaume and Bebbington (2021) as a starting point.

#### *The environment in accounting change*

The European tradition of accounting has always recognized the social side of accounting information, with a complex understanding of the role of accounting in markets (Hopwood, 1992, 1994). Scepticism about the insights of capital market research has resulted in the development of a distinctive European tradition of bringing ideas from sociology (Miller & Power, 2013), ecology (Gray, 2010), and other disciplines to study accounting within its institutional, social and environmental contexts (Burchell et al. 1980; Hopwood, 1978). Against this background, the idea that accounting is “a fluid and emergent craft” that has “a tendency to become what it was not” (Hopwood, 1987, p.207), supports exploration and experimentation with the environment in the context of accounting change (Gray, 2002).



Capital market research depicts CSR and carbon disclosure, integrated and non-financial reporting, or assurance as an observable, unproblematic reality despite the meanings of this list of terms often being unclear. In contrast, considering accounting in action (Hopwood, 2008) would call for a more conceptual and contextual inquiry into those categories that emerge in environmental accounting (viewing it as an emerging practice). Rather than the ambition of capturing diversity and complexity into a stylized type (e.g., integrated reporting), studying accounting in action calls for a more modest study of how environmental accounting practices are constructed and what functions they perform (MacKenzie, 2009).

Sustainability assurance has consistently attracted research attention, with studies finding contrasting evidence about its usefulness to increase the credibility of such information in *EAR* as well as in other journals. However, the elephant in the room is the question of whether and how sustainability information can be assured in the first place. O'Dwyer (2011) studied assurance in action, providing insight into the changing landscape of this activity and the different approaches of the two competing profession groups who are seeking to be assurers (see also Michelon et al. 2019).

The literature reviewed in this paper use a variety of terms to describe the area that it focuses on: ESG reporting (Young-Ferris & Roberts, 2023), non-financial reporting (e.g., Gao et al. 2016), integrated reporting (e.g., Caglio et al. 2020) and CSR disclosure (Cahan et al. 2016). The conceptual specificity of those terms is, however, rarely considered explicitly and clarity of what each means in relation to the other appears elusive. Concerns about the natural environment and human flourishing within the biosphere rests on the playing out of all those concepts, albeit in different ways. For example, integrated reporting and ESG stress how those concerns might impact the value of investor's assets (in what has come to be known as financial materiality), while

non-financial, sustainability, and CSR reporting often focus more on the corporate impact on the different aspects that challenge or facilitate the sustainability of socio-economic systems (impact materiality). These are distinctive perspectives, but they are rarely treated as such in the literature. Deepening the understanding of exactly what is being done under which label would increase the robustness of work in this area.

Exploring, for instance, how organisational actors, assurance professionals and financial market participants conceptualise, seek to assess and subsequently try to make use of information regarding various forms of impact would likely prove useful in this context.

Indeed, in the face of the proliferation of synonyms one possible reaction could be to focus instead on the practices in which those concepts materialize. In that regard, accounting materializes in identification, quantification, aggregation, visualization, and problematization processes. Studies of accounting in action can, for example, explore the hurdles encountered in attempts to integrate ESG inscriptions within financial accounting, casting doubt on specific claims made by the financial industry (Young-Ferris & Roberts, 2023) and demanding (for example) a critical interrogation of the operationalization of the taxonomy established by the EU Action Plan on Sustainable Finance. In this sense, notwithstanding the importance of financial markets, a perspective focused on financial materiality (e.g., ESG and integrated reporting) could produce a premature closure of environmental issues (Larrinaga & Bebbington, 2001), providing a false sense of security (Young-Ferris & Roberts, 2023) within an essentially uncertain environment. With the growing importance of environmental quantifications and attempts to integrate this information, there are significant opportunities to investigate accounting in action: a direction for which Antheaume (2004) and Hall and Millo (2018) provide valuable pointers. In the European context, we would stress the importance of studying the interplay between accounting and public policy (Bebbington

and Larrinaga, 2008), as well as the many other functions that environmental accounting has been found to play (Cho, 2009; Laine, 2010).

Studies can also illuminate how different knowledge is mobilized in accounting-in-action. Financial and sustainability accounting are often depicted as discrete and mutually excluding practices. However, case studies portray more complex settings, where sustainability managers make a contingent use of financial numbers (Henri et al. 2014; Rodrigue & Pickard, 2022), and hybrid constructions are attributed with meaning within organizations (Laine et al. 2017). Whether environmental accounting is the realm of accountants or sustainability managers has also been a longstanding and unresolved question (Collison & Slomp, 2000; Rodrigue & Pickard, 2022) and the differences between these groups have been observed to matter.

#### *Environmental accounting in a changing earth*

Accounting research on the environment as financial risk or as accounting-in-action has called attention to the need to integrate the natural environment into accounting and into financial markets. These studies, however, have only marginally changed the course of broader research programs, epitomized by voluntary disclosure (Leuz & Verrecchia, 2000). At the same time, the depth of ecological challenges (Folke et al. 2021) and the reconsideration of the interplay between nature and society (Larrinaga & Garcia-Torea, 2022) suggest a new twist in our conceptualisations. For example, the European Commission's (2019) attempt to mobilize finance for sustainable development suggests putting capital markets at the service of sustainable development rather than the reverse. Indeed, Mazzucato (2022) suggests that there is a "need to pivot from a reactive market-failure-fixing approach towards a proactive market-shaping one" (p.93). Likewise, we contend that the depth of ecological challenges demands imagining what an accounting to put it at the service of sustainable development would entail (see also Russell et al.

2017; Michelon 2021; Correa et al., 2023). The magnitude of human-induced environmental change and the Anthropocene should precipitate a paradigmatic shift in accounting (Bebbington et al. 2020a; Bebbington and Rubin, 2022) which we have hitherto not observed (how this could be achieved is outside the remit of this paper but is a topic that deserves closer attention).

This observation leads us to what we think about the future of environmental accounting research. Our first observation (and the *EAR* is no exception) is that environmental accounting continues to draw too closely on accounting preoccupations and is less informed about environmental and social aspects of concern (Bebbington & Larrinaga, 2014). As a result, accounting requires substantial transformations concerning cherished concepts and values. For example, attributing different objectives to the short and long term is deeply ingrained in accounting values. Those values are likely to be transformed in view of the urgency to address the rate of ecological change (see Tregidga & Laine, 2022).

Our second, and related, observation makes us call for critical reflection as it comes to publication patterns and the ideas of successful research. Institutional constraints, conventional expectations, and perhaps a sense of discipline comfort, appears to keep most accounting academics publishing within the confines of accounting journals, following traditional publication patterns and research formats (Gendron, 2008). We might, however, need to think differently, look across boundaries and expand the frontier. Late in the last century, Miller (1998) underscored the importance of exploring the margins of accounting, as this would help understanding how ideas drawn from the outside are significant in the transformation of accounting. We concur and note further that at times elaborating on such ideas requires the scholar to step aside from the usual doctrine and taken-for-granted assumptions prevalent in the field, and even leave aside

our identity of accounting researchers to make space for conceiving ourselves as researchers of ecological problems (Michelon, 2021). This may include collaborating with natural scientists as well as publishing in their journals (for example, see Bonetti et al. 2021; Österblom et al. 2022; Selig et al.2022) where organisational focused research objects and accounting data might combine with modelling traditions in ecology to deepen our knowledge of organisation action.

In addition, answering the challenges of sustainability may also require those serving as gatekeepers, i.e., reviewers and journal editors, to develop tolerance and courage to let different and innovative research approaches flourish (see Gendron & Rodrigue, 2021; Hopwood, 2008).<sup>7</sup>

## **5. Conclusions and moving forward**

In attempting to draw together the diverse threads that have been evident in prior *EAR* publications, we are going to return to the Sustainable Development Goals (SDGs) and pay more attention to the targets that have been agreed under each Goal. Elsewhere in the literature, the case has been made that the SDGs are often referred to without a depth of engagement with their contents (Bebbington & Unerman, 2020) and here we hope to remedy that in order to highlight valuable future research opportunities.

To recap, at the outset of the paper, we noted that the SDGs underpin organizational and accounting aspirations for action in the world that we inhabit. SDG goal 12 (and specifically target 12.6) are the most pertinent to our field in that it seeks to “encourage companies, especially large and transnational companies, to adopt sustainable practices and to integrate sustainability information into their reporting cycle” with the indicator

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<sup>7</sup> All of these themes have substantive implications for accounting education, both in the academy and within professional accounting bodies in the form of professional accounting education. To delve into these aspects would have extended what is possible in one paper, but we would be remiss not to highlight that our observations have substantive implications for education as well.

for achievement of this target being the number of companies publishing sustainability reports. Beyond this very specific target, the SDGs tend not to explicitly identify how accounting and reporting will support their realization. This is not the same as saying that accounting and reporting is not relevant to the goals. For example, target 8.7 seeks “immediate and effective measures to eradicate forced labour, end modern slavery and human trafficking and secure the prohibition and elimination of the worst forms of child labour, including recruitment and use of child soldiers, and by 2025 end child labour in all its forms”. Part of realizing this target would be robust ‘modern slavery reporting’ and developing ‘employer pays principles’ for migrant recruitment. Another example would be target 16.5 which seeks to “substantially reduce corruption and bribery in all their forms” and, again, accounting control systems are central to addressing corrupt financial practices.

To support our concluding comments on the paper, we conducted a systematic review of the SDG targets and linked them to accounting. This exercise highlighted some of the same conclusions as those from the literature synthesis in terms of identifying research gaps (outlined in Table 2). It quickly becomes apparent that management accounting is critical for achieving the SDGs and is essential if organizations are to translate this global agenda into concrete actions that will contribute to sustainable development. This observation contrasts with the paucity of management accounting studies that we have documented in the *EAR* cannon over the last 30 years. Further, recent work by Garcia-Torea et al. (2022) increase the salience of this point. In their synthesis of accounting and management studies papers that seek to address the likelihood of environmental change the crucial role of management accounting was highlighted. For example, they note that studies suggest that “internal SAR [sustainability accounting and reporting] forms are more likely to drive substantive change” and that the “incorporation of SAR

concerns in internal decision-making is indicative of authentic organizational commitment” (Table 3 of their paper). The relative absence of management accounting studies in the *EAR* highlights areas for impactful and insightful research.

## **Table 2: SDGs and management accounting**

### **SDG target (and indicator) implicating management accounting**

**Target 6.4:** By 2030, substantially increase water-use efficiency across all sectors and ensure sustainable withdrawals and supply of freshwater to address water scarcity and substantially reduce the number of people suffering from water scarcity (change in water-use efficiency over time)

**Target 8.4:** Improve progressively global resource efficiency in consumption and production and endeavour to decouple economic growth from environmental degradation (no target linked to organisations but focus on material footprint)

**Target 8.8:** Protect labour rights and promote safe and secure working environments for all workers, including migrant workers, in particular women migrants, and those in precarious employment (this could be reported on by individual companies)

**Target 10.7:** Facilitate orderly, safe, regular and responsible migration and mobility of people, including through the implementation of planned and well-managed migration policies (recruitment costs borne by employers)

**Target 12.2:** By 2030, achieve the sustainable management and efficient use of natural resources (no target linked to organisations but focus on material footprint analysis)

**Target 12.3:** By 2030, halve per capita global food waste at the retail and consumer levels and reduce food losses along production and supply chains, including post-harvest losses (food loss index and food waste index)

**Target 15.2:** By 2020, promote the implementation of sustainable management of all types of forests, halt deforestation, restore degraded forests and substantially increase afforestation and reforestation globally (progress towards sustainable forest management)

Other SDGs targets focus on public sector activities, another area for which there appears to be a dearth of research. For example, target 12.7 seeks to “promote public procurement practices that are sustainable, in accordance with national policies and priorities” while target 13.1 seeks to “strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries” with the indicator of the success being the proportion of local governments that adopt and implement local disaster risk reduction

strategies in line with national disaster risk reduction strategies. The kinds of processes and the data used to underpin such strategies are amenable to accounting research. In addition, accounting control approaches will be critical for local government effectiveness in this area.

Our review also identified the enabling role of finance in achieving the SDGs including targets focusing on strengthening the capacity of financial institutions to expand access to banking, insurance and other financial services (target 8.10) and improving regulation and monitoring of global financial markets and institutions and strengthen the implementation of such regulations (target 10.5). Another target of relevance to financial system integrity (with an intersection with forensic accounting) is to significantly reduce illicit financial and arms flows, strengthen the recovery and return of stolen assets and combat all forms of organized crime (target 16.4). In all these respects, the SDGs (at sub-goal level) provide indicators of accounting, reporting and finance related research that would be highly salient for pursuing sustainable development.

Finally, we would like to circle back to the themes introduced in section 2 to craft suggestions for a holistic way forward for future *EAR* publications. The themes introduced in the context setting section were: (1) environmental change is a systems issue (with salience and materiality coming from the state of that system); (2) environmental accounting issues may need to be disaggregated (and place-based in some instances) in order to capture the underlying complexity of the system; (3) there is an increasingly stronger regulatory context that demands more sophisticated management control (such as along complex supply chains) and financial/non-financial reporting (for discharging accountability and perhaps demonstrating stewardship); and (4) there are emerging practices that focus on the governance of the financial system.

These four contextual themes, combined with the analysis conducted in the paper



suggest that future research should: recognize the socio-ecological nature of the environment in which we imagine accounting will ‘work’; recognize that regulatory effects come from many points in the system (not solely accounting related regulation); and where necessary (and it will often be so) focus on place-based accounting and accounting for specific elements of the environment (most critically climate, biodiversity, water and materials flow). In all these instances it is also necessary to ensure that research questions expand their focus to interrogating economic arrangements. Indeed, it is the dysfunctional effects of our current economic arrangements that are creating the various crises for which sustainable development is proposed to be the solution and, as accountants, we are well placed to understand and reform/reconfigure economic systems and the relationships implicit in them. This is the critical task of the near future and something that we look forward to learning about in the pages of *EAR*.

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