



Contents lists available at ScienceDirect

Critical Perspectives on Accounting

journal homepage: www.elsevier.com/locate/cpa

Sustainability at stake during COVID-19: Exploring the role of accounting in addressing environmental crises

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ARTICLE INFO

Article history:

Received 19 December 2020

Revised 29 April 2021

Accepted 3 May 2021

Available online xxxx

Keywords:

Environmental crisis

COVID-19

Social and environmental accounting

Accountability

ABSTRACT

In this paper, we reflect and provide insights on the environmental implications of post-COVID-19 economic recoveries. More specifically, we highlight the connection(s) between the environment and the COVID-19 crisis, in particular the intertwined links between Mother Nature and the virus. We then raise some concerns about the 'illusionary' positive and negative effects of the crisis on the environment before evoking some past lessons about crisis management and recovery. We contend that the current accounting and accountability mechanisms employed in economic stimulus programs, as well as traditional environmental accounting approaches, are inadequate and limiting to achieve long-term sustainability change. The paper concludes by offering accounting practitioners and researchers some possibilities to take a step forward and develop new understandings of social and environmental value consistent with ecological principles and sustainable development—and hope that these reflections will contribute to a broader debate on the role of accounting for sustainable development in the Anthropocene.

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1. Preface

Intimate relations between humans and the non-human world suggest that we are now living in the Anthropocene (Crutzen, 2002; Davies, 2016). The human imprint on the ecological processes has become so large and active, that it impacts the planet's system on a scale never seen before in its history and will determine the future geological evolution of the Earth (Rockström et al., 2009). Given these clearly established immense planetary issues, and the advent of the unprecedented COVID-19 pandemic crisis, this paper aims at highlighting the environmental implications of post-pandemic economic recoveries. More specifically, we argue that the current accounting and accountability mechanisms employed in economic stimulus programs – the common policy response to the COVID-19 crisis and the existing social and environmental challenges – are inadequate to achieve long-term sustainability change. In response, we suggest more meaningful ways for accounting practitioners and researchers to contribute to existing sustainability challenges.

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2. The environment and COVID-19

2.1. The intertwined links between Mother Nature and the virus

Since the beginning of civilization, humans have increasingly manipulated their natural environment for their own benefit. Increasing levels of industrialization, population and urbanization have resulted in a steep increase of environmental concerns including climate change, air pollution, water depletion and biodiversity destruction. Nowadays, humans are acknowledged to be the dominant driver of environmental change, with scientists arguing that the Earth has now entered the new epoch of the Anthropocene. By now, humanity has transgressed at least three of the ten planetary boundaries necessary to establish a safe environmental operating space—namely the rate of biodiversity loss, climate change and the nitrogen cycle (Rockström et al., 2009).

In addition to planetary degradation, researchers have also examined the impact of habitat destruction on global pandemics. According to the Chinese Center for Disease Control and Prevention, the novel coronavirus (COVID-19) was first identified in Wuhan, China in December 2019 and the outbreak most likely originated from wild animals sold at a market in the city.¹ Transmissions of viruses from wild animal species onto humans happen regularly (O’Callaghan-Gordo & Antó, 2020) and at least 60% of all emerging infectious diseases recorded between 1960 and 2004 originated in non-human animals (Jones et al., 2008) – these animal-to-human transmissions are not due to chance. Instead, there is increasing evidence that ecological changes—including the transformation of natural habitats and ecosystems through human actions—have led to increased rates of transmissions between animals and humans. A key issue highlighted by Vidal (2020) relates to how human interference with nature has reduced the barriers between themselves and potentially infected host animals. Due to the decrease in wildlife habitats, animal species are now forced to be in closer contact with humans in order to survive, thus resulting in a higher risk of transmission between wild animals and people. O’Callaghan-Gordo and Antó (2020, p. 2) even call COVID-19 a “paradigmatic example of an Anthropocene disease”. Moreover, it is argued that these transmissions and the high COVID-19 mortality rate are most likely influenced by higher air pollution levels, at least in Northern Italy (Conticini et al., 2020).

Unfortunately—and as discussed in the next section—the advent of the global COVID-19 pandemic in 2020 has magnified the effects of ongoing environmental destruction and made them even more obvious. Without a doubt, the COVID-19 pandemic is the biggest crisis since the Second World War, resulting in massive irretrievable human suffering all over the globe (Muhammad et al., 2020) – by March 2021, the total number of COVID-19 cases exceeded 114 million, with more than 2.5 million reported deaths worldwide (European Centre for Disease Prevention and Control, 2021).

2.2. The illusionary positive and negative effects on the environment

As an increasing number of countries entered lockdown,² numerous personal and industrial activities were halted—resulting in factories, shops and schools being temporarily shut down (Wilder-Smith & Freedman, 2020). As a result of reduced economic activities and the decline of anthropogenic activities, several scholars have reported positive impacts of the lockdown on the condition of beaches (one of the most critical ecosystems for coastal areas), the level of environmental noise (Zambrano-Monserrate et al., 2020), global CO₂ emissions (Le Quéré et al., 2020), and air pollution (Dutheil et al., 2020; Muhammad et al., 2020).

One of the most discussed environmental changes due to nation-wide lockdowns has been a temporary reduction in CO₂ emissions due to massive travel restrictions, with more than 96% of flights being cancelled—which has dropped the level of international travel to its lowest level in 75 years (Wallace, 2020). According to Le Quéré et al. (2020), daily CO₂ emissions in April 2020 decreased by 17% compared to 2019 levels with more than half of the reduction being credited to changes in surface transport. They also estimate an annual reduction of CO₂ emissions between 4 and 7% in 2020, depending on government actions in the second half of the year. In addition, global air quality changes have also been discussed within the literature as being linked to the imposed global traffic restrictions. However, despite the broad range of short-term environmental improvements which became visible apparent during the pandemic, not all lockdown policies were as effective and beneficial for the environment as they appear at first glance. In fact, some effects of COVID-19 have been more detrimental to the global environment in the long term, as we discuss below.

On the one hand, and in contrast to the optimistic emissions reduction observed and discussed above, the United Nations (UN) World Meteorological Organization (WMO) stated that the cut in CO₂ emissions due to shutdowns is only a “tiny blip” in the ongoing increase of greenhouse gases in the air due to human activities. In fact, the WMO warned that “climate-heating gases have reached record levels in the atmosphere despite the global lockdowns caused by the coronavirus pandemic” (Carrington, 2020, n.p.) and according to one scenario modelled by the International Energy Agency (IEA), CO₂ emissions are expected to rebound in 2021, exceed 2019 levels by 2027 and rise to 36 gigatons by 2030. The agency has also provided evidence that “countries are planning emissions cuts that amount to only 15% of the reductions needed to fulfil the Paris agreement” (Harvey, 2020b, n.p.). Overall, the temporary reduction in greenhouse gas emissions is not

¹ The virus was officially named SARS-CoV-2 by the World Health Organization (WHO). It spread rapidly around the world and quickly developed into a global pandemic far beyond the Chinese borders.

² It is estimated that about half of the global population was placed under some form of lockdown by March 2020 (Tosepu et al., 2020).

enough to put a real brake on global warming.³ In 2020, our global footprint exceeded one earth and the concentration of carbon dioxide in Earth's atmosphere is above 400 parts per million (ppm) and rising. A recent analysis in the journal *Nature* shows that the nine tipping points after which the planet collapsed appear close to reaching (Lenton et al., 2019).

On the other hand, another significant environmental concern is the treatment of medical waste. Given the increased use of disposable personal protective equipment (PPE) and other medical supplies, it is estimated that hospitals have produced around six times as much medical waste during the peak of the pandemic when compared with pre-pandemic times. But it is not just the amount of waste, but also the nature of the waste that is concerning. A plastic-production boom is now happening with a global demand for a new range of material (i.e., medical supplies such as ventilators, masks, gloves, tests), and in response to the pandemic, the global population has also suddenly started wearing masks—including single use surgical ones—and disposable gloves, drastically increasing the amount of waste produced. Most of the single use masks are plastic based, with materials that are long-lasting, and as such will end up on landfills or in the ocean (Mukhopadhyay, 2020), and this inorganic waste generation is accompanied by a broad range of environmental problems including water and air pollution, soil erosion and deforestation (Mourad, 2016; Schanes et al., 2018).

3. Crisis recovery: lessons from the past and worries for the future

3.1. Overview of stimulus programs and initiatives in Europe

So, what has been the policy response to deal with the COVID-19 crisis as well as the social and environmental issues discussed within the previous section? One common policy tool used have been stimulus packages, which are designed – in theory and praxis – to safeguard future living conditions for life on Earth. Given the urgent need to help both the economic recovery and the fight against unemployment, while also accelerating decarbonization towards clean energy transitions and support biodiversity conservation, some major recovery plans have been deployed.⁴ One of the most significant initiatives is the €750 billion recovery package (called Next Generation EU) adopted by the European Commission on May 27, 2020 to pave the way for a more sustainable future. Sustainability and climate issues are at the core of the package with more than €500 billion (or 30 percent of the package) allocated towards this cause. We focus on this package because this is the “biggest green stimulus in history” (Krukowska & Lombrana, 2020, n.p., our emphasis) directed to several areas, including expenditures earmarked to promoting energy efficiency, and developing renewable energy resources, sustainable transport, and agriculture among other measures of environmental protection. Besides its large scale in terms of amount, magnitude and scope, the stimulus package also affects multiple countries.

Furthermore, the plan complements the wider agenda to address the environmental crisis within the EU. For instance, this new COVID driven green stimulus is central to the European Green Deal (EGD) adopted in May 2020. Covering up to one trillion euros over ten years, the EGD constitutes a roadmap towards a sustainable EU economy post COVID. Its final goal is to reach zero emission by 2050, with the reduction of greenhouse gas emissions by 50% by 2030, mainly by “cutting emissions, investing in green technologies and protecting the natural environment” (n.p.), according to the European Commission and it forms part of the EU's strategy to implement the UN's 2030 Agenda and the Sustainable Development Goals (SDGs). The recovery fund is planned to be spent only on green projects that meet certain criteria and 30% of all funding will go to climate change mitigation, but few details are given on what constitutes a green project.

3.2. Learnings from previous economic stimulus programs

Using economic stimulus packages is not necessarily new—significant stimulus programs have been introduced in the past. For example, in response to the 2008 financial crisis, an estimated \$3.3 trillion was allocated worldwide (China, US, South Korea, Japan, and EU) with 16% (\$522 billion) devoted to green measures (i.e., low carbon energy, pollution abatement, materials recycling). In the EU, a recovery plan – namely the European Economic Recovery Plan – proposed by the European Commission in 2008 aimed to encourage member countries to promote energy efficiency and investments in climate-friendly technologies with a total budget worth around €200 billion. At that time, and despite a multitude of policy and environmental measures, a long-term decrease in global carbon emissions could not be observed. Although greenhouse gas emissions declined in 2009, they rebounded quickly by 5.9% in 2010 and reached a record high (Peters et al., 2012) as governments moved to restart their economies. As such, the EU economic stimulus package adopted after the financial crisis aimed at supporting environmental recovery failed to achieve their climate goals.

Despite prior failures, a similar approach is now being called for as part of the 2020 European recovery plan response for investments and stimulus measures. Although the 2008 financial crisis and the COVID-19 pandemic are different, the experience of the former makes it clear that the effects of governments' stimulus packages need to be assessed with

³ Moreover, France has restarted its coal plants in September 2020 (Wajsbrot, 2020) and some American oil giants, such as Chevron and Exxon Mobil, have been spending a total of \$200 million a year on efforts to operate and expand fossil fuel operations (Laville, 2019). Such lobbying efforts from the US oil industry are documented in great details by Cho et al. (2015; 2018).

⁴ To ensure a green recovery, Canada called for key principles, criteria, and conditionalities that should be attached to COVID-19 recovery measures (see Corkal et al., 2020, p. 3). Likewise, recovery funds for the agricultural sector have also been agreed on at the EU level and a total of €10 billion will be made available to farmers until the end of 2022 to help the recovery of the sector.

respect to the long-term environmental impacts and they will require more lasting and ambitious transformations (Harvey, 2020a). Given this, the lessons learned after the financial crisis need to be integrated into the EU's policy response to COVID-19 if they are to use this opportunity to build back better and ensure long-term social and environmental resilience.

The question that arises from the developments above is *'why are the most common responses to environmental crises – such as governments' economic stimulus packages – unable to achieve the environmental transformation urgently needed on a global scale?'*

First, the previous EU stimulus program lacked effective oversight and control over the activities being mobilized to pursue environmental strategies. To some extent, it seems the EU has begun to rethink its approach. As part of the EU's commitment to become climate-neutral by 2050, the new EU Climate Law was drafted including a new progress monitoring system. However, and while the EU already has well-developed environmental laws in place, most remain currently unenforced (e.g., Bebbington et al., 2012; Chauvey et al., 2015; Senn & Giordano-Spring, 2020).

In addition to the lack of oversight and enforcement that has marred the EU's progress towards environmental goals, the EU stimulus package also confronts economic boundaries because by design, sustainability goals have tended to be subordinated to economic goals. Boundaries "separate the 'inside' from the 'outside'" (Roberts, 2021, p.2) and thus, define what is taken into account or left out when making a particular decision. Previously, the EU stimulus package's funding was mainly aimed at particular industries and economic sectors and thus reflected an approach within narrow industry and organizational boundaries. As reflected in the post-2008 financial crisis, airlines and oil giants are good examples of a narrowly targeted efforts. However, sustainability concerns transcend the boundaries of individual organizations (Antonini & Larrinaga, 2017) and thus would require a broader boundary setting. As a result, the deployed stimulus programs often rely on accounting and accountability mechanisms that are ill-suited to achieve long-term environmental change. The following section will analyze in more details what the limitations of these accounting practices are before providing suggestions about how they could be improved.

4. Rethinking the role of accounting in addressing environmental challenges

4.1. The limits of traditional environmental accounting approaches

What insights can we draw from the example of the failed EU stimulus program post 2008 and the current EU Green Deal in relation to its underlying accounting system?

First of all, the current boundaries drawn fail to reflect the interconnectivity and interdependency of the natural ecosystem in which the EU operates. Human action and environmental consequences are deeply interconnected—and as such need to be accounted for in an interconnected way. Changes in our climate system are not linear; their unstable and unpredictable nature are embedded into complex and challenging process. This means that we need to understand *systems* (and how *natural systems* can be accounted for) as well as contribute to the knowledge of those systems before promoting specific solutions. However, accounting practices are seemingly unable to account for the interconnections and interdependencies taking place within the natural system in which organizations operate (Bebbington et al., 2020; Russell et al., 2017). To date, most of the traditional accounting approaches have been taking place within the traditional boundaries of corporations. Yet, "any simple assessment of the relationship between a single organization and planetary sustainability is virtually impossible. The relationships and interrelationships are simply too complex" (Gray, 2010, p. 48). In this regard, the concept of environment is usually conceived as central to business and based on *what organizations should do* to help address the ongoing environmental crisis. It requires a perspective that goes beyond individual entities. This phenomenon of inappropriate boundary setting is not just noticeable in the EU Green Deal, but also in accounting research aimed at supporting social and environmental challenges. Over the years, a strong basis of research has built up in the field of social and environmental accounting (SEA)—and while this research provides us with a range of insights related to accounting practices and sustainability, the field has been dominated by a focus on single organizational boundaries. However, so far, it is questionable to what extent certain SEA practices proposed and examined in the accounting literature actually enabled sustainable development or rather perpetuated 'business as usual' programs (Larrinaga-Gonzalez & Bebbington, 2001) without providing any material change (Gray, 2010).

In addition to the boundary issue, we believe that there is bigger potential for research aimed at better understanding the role of accounting in the transition towards a sustainable society. While organizational impacts play a vital role within that, capturing the ideas from a range of stakeholders is likely to be important when addressing sustainability as well. Such arguments suggest that any single account will not reflect the diversity of views and perspectives involved (Russell et al., 2017). For instance, counter accounts produced by external parties (i.e., expert reports, online journals, NGOs, etc.) represent alternative representations of organizations able to facilitate and encourage the voices of diverse interests (e.g., Brown et al., 2015; Laine & Vinnari, 2017). The message they convey would improve the governance and accountability systems of organizations. As such, a multiple account approach could also improve the accountability and monitoring system employed under the current EU Green Deal. Here, the EU has begun to rethink its approach as the Commission plans to launch a European Climate Pact to give citizens and stakeholders a voice and role in designing new climate actions and finding solutions.

Besides the shortcomings of accounting research discussed above, we argue that SEA research does have the potential to achieve positive long-term environmental change. As such, the following section will outline the possibilities of accounting research to positively contribute to existing environmental challenges.

4.2. More possibilities for meaningful environmental accounting

We, as a society, currently seem ill equipped to govern the social-natural system under this era of the Anthropocene (Hamilton et al., 2015). And while SEA academics have long been involved in investigating the role of accounting for society and the environment, most of the current SEA practices discussed within the literature tend to be explored in the same old way (Michelon, forthcoming); and are thus unable to overcome the limitations outlined above. Nevertheless, if accounting is conceived not just as representing performance but as a productive technology (Miller & Power, 2013), accounting holds the potential to provide the visibility about the state and sustainability of ecosystems in business decision processes. As such, it is possible that “the discipline of accounting might, under certain conditions, allow organizations to address sustainable development challenges” (Bebbington & Larrinaga, 2014, p. 396). So, what would need to change within SEA in order for us to address pressing environmental challenges? Our personal reflection is developed around four areas of possibilities.

First, there is a need to focus on the underlying “socio-economic arrangement[s]” (Bebbington and Larrinaga, 2014, p. 401), rather than being restricted by the traditional focus of accounting on individual entities. In opposition to organizational centered research, an emerging literature has built up focusing on socio-ecological systems (e.g., Bebbington et al., 2014; Cuckston, 2017; Feger & Mermet, 2017; Russell et al., 2017; Sobkowiak et al., 2020), aiming to re-center the focus of SEA research away from individual organizations. Their findings suggest that novel forms of ecological account-giving might increase the visibility of our socio-ecological interdependencies. Thus, any accounts of nature or organizational impact on nature should incorporate a systems-approach, rather than treating organizations as being detached from their natural environment. One outcome of socio-ecological centered accounts is that it provides the opportunity to further interrogate understandings of the “conditions in which forms of organizing of human and non-human actors into socio-ecological systems become thinkable and possible.” (Cuckston, 2017, p. 1560). Such systems-thinking approach would also enable accounting researchers to reflect on the *interdependencies* and *interconnections* within the environmental system in which we, as a society, operate. It would also illustrate how organizational impacts on certain aspects of the environment such as climate change or biodiversity loss are neither linear nor understandable without considering the system as a whole. In the same vein, more research on the use of SDGs for shaping understandings of organizational responsibilities (Bebbington & Unerman, 2020) could help address the link between organizations and global-level interactions.

Second, the use of science-based scenario modelling and emissions target setting in order to support organizational climate action will require the attention of SEA academics. This kind of initiative could help understand how global sustainability analyses can be translated to the organizational level (Larrinaga, 2020). Besides science-based targets and scenario planning, thinking at the level of *systems* will play a substantive role in helping to represent the connection between organization and the broader socio-ecological systems (Larrinaga, 2020). Here, the recent initiatives such as the Task Force on Climate-related Financial Disclosures (TCFD) focusing on indicators based on climate-related risks and dependencies represent an area where accounting academics could contribute. They can be particularly proactive in the development of this form of climate dependencies disclosure and its inherent risks and opportunities (see O'Dwyer & Unerman, 2020 for a number of research agendas in this direction).

Third, consistent with the idea that the context in which accounting tools exert control evolves under Anthropocene conditions, greater accountability will be required. According to Bebbington et al. (2020), a complete paradigm shift in understanding accountability as well as the functions and boundaries of traditional accounting techniques and tools is needed. In particular, the complexity of the interplay between our ecosystems and industries requires extending the understanding of accounting and “the aspects for which organizations may be held accountable and how such accountability may be determined and discharged” (Bebbington et al., 2020, p. 169). For example, it is still unclear whether measuring and reporting against sustainability indicators (e.g., emission targets) will have an impact on climate change mitigation and actions (Cooper & Pearce, 2011). In this context, it has been generally assumed (by the literature and different frameworks) that investors were the primary users of this information, particularly in their investment decisions (e.g., Campbell & Slack, 2011; Holm & Rikhardsson, 2008; Milne & Patten, 2002). Notwithstanding the importance of such actors, some scholars have suggested that a better consideration of a broader array of stakeholders beyond that of financial accountability is needed (e.g., Solomon et al., 2011; Laine & Michelin, 2020). Reducing climate change is not only a ‘market problem’. Extending the boundaries of traditional accountability has potential to bring new insights into the potential of new conceptual tools relevant for accounting. More specifically, we need to focus on how accountability can enlighten industries about the risks and opportunities of a changing climate in the long-term. To achieve those objectives, multi-, inter- and trans-disciplinary engagements (see Pimentel et al., 2021) are likely to be required as a way of reframing the responsibilities and accountabilities of organizations, and potentially transform them. For example, novel conceptualizations of accounting and accountability in collaboration with sustainability and earth system sciences scholars are a way of achieving the necessary ‘ecological turn’ (e.g. Bebbington et al., 2020). In addition,

Leuz (2018)'s proposition to construct knowledge around topics and questions – not methods and fields – could help imagine impactful research into new forms of sustainability accounting systems.

Finally, this need for change would also have to be extended to the way we teach and educate future accountants and managers. Two tenets of incorporating sustainability in accounting courses are important. On the one hand, changes in accounting education aimed at enabling future accountants to better understand and deal with the complex social and environmental system in which they operate in are still in its infancy. In order to grasp the seriousness and complexity of analyzing and solving ethical problems, it is essential for students to take courses in accounting ethics and sustainable development (Boulianne & Keddie, 2018; Cho & Mäkelä, 2019; Gray et al., 1994; Lawson et al., 2014; Loeb, 1991). The literature shows how managers are struggling to make sense of environmental issues (Hill & Thompson, 2006). Incorporating ethical and social aspects into accounting education could help accountants and auditors meet these new challenges (Gray et al., 1994) and hopefully support the development or governance of more eco-conscious business practices within businesses. On the other hand, these changes are interlinked to research-informed teaching (e.g., Cho et al., 2020). Undertaking and understanding sustainable challenges require new methodologies and new ways of approaching accounting education. More specifically, academics seeking to make a substantive impact on sustainability need to be aware that sustainability does not concern only organizations but many other actors in society such as governments, NGOs and local communities. Their importance grows even more in periods of crisis. As such, new kinds of participatory methods and multidisciplinary thinking (e.g., experiments, business modelling, systems mapping) are likely to be useful in understanding how organizations can act creatively on sustainable transformations.

Overall, we suggest that there are various ways in which the accounting scholarship could contribute to global environmental challenges and lead to improvements in existing practices deployed in order to tackle challenges such as climate change. In particular, we believe these areas where academic research can contribute need to be considered and addressed in the development of the EU Green Deal. The possibilities are separately discussed above while noting that they are interconnected—by incorporating a systems focused accounting system influenced by science based targets, with better accountability mechanisms and by additionally incorporating better education practices might lead to transformational changes.

5. Concluding remarks

The essay offers some reflections on the intertwined relations between our planetary ecosystem and the COVID-19 virus and pandemic. While contrasting the positive and negative effect of the crisis on the environment is a useful exercise and analysis, the root causes of, and links to a deadly novel coronavirus with biodiversity sustainability and environmental issues seem to be clearly established and more relevant. More broadly, there are good reasons to believe the pandemic will make the “net zero carbon” by 2050 for the EU even tougher to achieve (Yergin, 2020). Looking back to the UN's 2030 Agenda for Sustainable Development, we as a population are not where we need to be, and most countries are falling short of the UN SDGs targets. And while we are encouraged to see that sustainability issues are becoming more prominent and ubiquitous in business, we as critical accounting researchers have a paramount role to play in engaging, critiquing and further developing business related sustainability initiatives given our extensive research and experience about the limitations of mainstream accounting techniques and underlying economic assumptions, in order to avoid the corruption of SEA and critical accounting aims and motivations (see Cho, 2020 for further insights).

The essay further provides insights on how SEA academics could address current environmental challenges increasingly to the future of the planet. Drawing on the example of stimulus packages – in particular the EU Green Deal – the essay highlights existing limitations within common responses to environmental crises that can hinder the achievement of long-term global change, such as a lack of accountability mechanisms or wrong boundary setting, often linked to the underlying accounting system. Despite the admittedly inherent limitations and challenges of traditional environmental accounting related to, and caused by organizational boundary issues, we still believe in the potential for more and better engagement with practice and a systems-thinking approach leading to enriching, practice-based interdisciplinary research needed to tackle grand challenges in an effective and meaningful way (Pimentel et al., 2021). As such, we discussed four distinct but interrelated areas where academic research can contribute to improving current accounting practices and hopefully lead to better outcomes of practice responses such as stimulus packages. In brief, the propositions developed are, that (1) adopting a systems approach rather than being restricted by a single organizational focus; (2) using science-based targets to inform goal setting; (3) rethinking adopted accountability mechanisms; and (4) incorporating better education practices for future decision makers and accountants are likely to drive large-scale changes. In particular, we argue that the shift of mindset and paradigm is more likely to happen at the training and education stage; that is, the topics and the way we, as SEA academics, teach accounting constitute a crucial juncture. We need to push for substantial changes in education paths, courses, programs and curricula to allow systems and outside the box thinking.

Given all the challenges we face, we must deal with the fact that SEA research is not taken for granted. Ultimately, this leads us to take a step forward and develop new understandings of social and environmental value consistent with ecological principles and sustainable development. Alongside developing research into new forms of accounting, academics such as ourselves can help organizations cross bridges that embrace different practices towards a sustainable society and planet.

We hope that these reflections will contribute to a broader debate on the role of accounting for sustainable development in the Anthropocene.

Acknowledgements

We would like to thank Editor Jane Andrew for giving us the opportunity to contribute this article to the special issue "The Environment in Crisis" for *Critical Perspectives on Accounting* and two anonymous reviewers for their insightful comments and suggestions. Charles Cho also thanks Annabelle Chan for her research assistance and acknowledges the support provided by the Erivan K. Haub Chair in Business & Sustainability at the Schulich School of Business. We would also like to pay a tribute to the memory of Professor Rob Gray, Professor Keith Maunders and Professor Jeffrey Unerman, who very sadly passed away recently. They were the pillars of social and environmental accounting research and paved the way for us. We dedicate this article to them.

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