

Measuring and managing ‘sustainability-related’ performance

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Abstract

Over a decade ago, Bititci et al. (2012) identified sustainability as an emerging trend in the performance measurement and management (PMM) field, calling for the integration of these ideas. In recent years, research on environmental sustainability related measurement (e.g., circular, green, net zero, planetary boundaries) has grown exponentially, but also fragmentally, largely ignoring key PMM ideas involving deployment, alignment, feedback, and control. As a result, scholars and practitioners currently face a multitude of indicators to choose from but little guidance in terms of how to use metrics to manage sustainability. To address environmental sustainability and inter-related PMM, we conduct a problematising review of the literature, critically evaluating *what to manage*, *what to measure*, and *how to manage* environmental sustainability. In this developmental paper, we outline our approach and initial findings, and hope to collect constructive feedback during the BAM Conference 2023. This work will contribute to knowledge through joining fragmented research and creating a research agenda that translates the main learnings from the PMM field to the field of environmental sustainability (and its inter-related concepts).

Key words: measurement, performance management, circular economy, sustainability, green growth, net zero, planetary boundaries

Type of paper: Developmental

Track: Performance Management

1. Introduction

Over a decade ago, in their review of the performance measurement and management (PMM) field, Bititci et al. (2012) identified sustainability as an emerging trend, suggesting that future scholarship would have to address the challenge of measuring and managing sustainability performance. Ten years on, as the environmental sustainability agenda in particular became more pressing, it is not surprising that numerous controls and incentives have emerged, for example through new governmental policies and corporate objectives.

Whilst it is positive that contributions to the creation of controls have been large and multidisciplinary to address such paramount challenge, the environmental sustainability related PMM field has become an overlapped, fragmented, and often contradictory field (Mura et al., 2018). The effect is that individuals, corporations, and policymakers trying to implement PMM systems are faced with a myriad of not clearly differentiated terminologies and approaches, leading to confusion and misalignment. It starts from the very understanding of what business and policy should be trying to address – should it be achieving ‘sustainability’, ‘green growth’, ‘circular economy’, ‘net zero’, or keeping environmental damage within ‘planetary boundaries’? As all these frameworks are somewhat contested - and several practitioners and policy makers do not understand how they are overlapped or distinct -, a phenomenon of inconsistency and duplication emerges in practice (Sauvé, Bernard and Sloan, 2016; Korhonen et al., 2017; Spaiser et al., 2017; Stoknes and Rockström, 2018; Hickel and Kallis, 2020; Fankhauser et al., 2022). This is perhaps best represented in the award of research grants to address national priorities. For example, in the UK a multi-millionaire four-year research award was made to a national ‘circular economy’ research centre comprised by several universities, only to be followed by a grant of similar magnitude to a ‘net-zero’ centre to different institutions two years later, to work with the same organisations already involved with the first centre.

Despite the lack of consensus on what we are trying to achieve, research on *what to measure* in the sustainability-related realm has also expanded exponentially, with several indexes being created to measure circular, green, net zero, or sustainability performance at various levels (e.g., Saidani et al., 2019; López-Arceiz, Del Río and Bellostas, 2020). For several decades, PMM theory has developed important concepts when discussing technical and social controls, such as ‘alignment’ and ‘strategy deployment’ through different levels (Neely, 1999). However, although PMM theory had been highly influential in the management field, it was largely ignored by research on environmental measurement, which emerged from other disciplines, including engineering, physical environmental sciences, and industrial ecology (Pisani, 2006; Ghisellini et al., 2016). Without a PMM background, it is interesting to observe that environmental-related measurement has so far mimicked the evolution of the PMM field itself, with the early stages so far being characterised by an over-emphasis on metrics with less scrutiny on how they can be used in practice as control mechanisms (Bititci et al., 2012).

Recognising the need to critically assess *what to manage*, *how to measure it*, but also to start addressing *how to manage* sustainability performance, we conducted a review to evaluate the literature through the lens of PMM, ultimately aiming at re-framing the field to guide future research and practice. This developmental paper therefore provides our approach, aiming at collecting constructive feedback during the BAM Conference 2023. Section 2 will detail the approach that will be undertaken in this review, whilst Section 3 will present a potential problematization of the literature.

2. Review Approach

Several approaches for literature review exist in the management field. Systematic reviews have become particularly popular, borrowing from the medical sciences the belief that large bodies of social research can be systematically analysed, increasing the reproducibility and rigour of a field (Tranfield et al., 2003). Integrative reviews are generally systematic, in which scholars synthesise large quantities of studies, integrating the body of knowledge, and often providing a critique (Elsbach and van Knippenberg, 2020). Despite the dominance of integrative reviews, Alvesson and Sandberg (2020) have questioned their ability to lead the way to knowledge by simply building upon existing studies. They proposed the *problematising* review as an alternative, which has recently been used to critically appraise the assumptions underpinning CE research (Dzhengiz et al., 2023). In conducting problematising reviews, authors should attempt to read broadly but selectively, synthesising less studies in more depth, and reconstructing the literature in a creative way based upon key criticisms.

In this study, we adopted a problematising review approach, for two reasons. Firstly, to acknowledge that the exercise of synthesising different indicators has been conducted previously, for example culminating in circular economy or sustainability indexes (Saidani et al., 2019; López-Arceiz, Del Río and Bellostas, 2020). However, there is still a need to understand the best indexes in detail and to reflect on how such indicators can be applied (Accenture, 2022). Secondly, problematising reviews are useful to break away from dominant assumptions, frameworks, and classifications, and would help surface critical aspects of PMM that should be addressed by future scholarship (Alvesson and Sandberg, 2020). For instance, in the field of ‘circular economy’, most indexes have followed the categorisation of micro, meso, and macro levels proposed in Ghisellini et al (2016)’s seminal paper, a classification that arguably provides little guidance to practitioners regarding how to apply metrics.

To elevate the environmental sustainability-related measurement theory, we believe that lessons can be learned from the more mature field of PMM which, based on organisational control and management control bodies of knowledge, includes theories on how to develop and use technical and social controls to leverage system change. We therefore selected PMM theory as a lens to critically evaluate and elevate the sustainability measurement theory. In doing so, we recognise that many PMM concepts transcend the boundaries of firms and can be applied to higher-level systems, such as supply chains and industry networks (Bititci, Carrie and McDevitt, 1997).

PMM research argues that effectively managing performance requires creating a shared understanding of *what needs to be managed* (Bititci, 2015). In the sustainability-related theory, there is an overlapping, inconsistency, and contestation of concepts, therefore requiring re-framing and clarification. Once a shared view is established, the second step is deciding *what and how to measure* (Bititci, 2015) – an area where we perceive the most development in the sustainability-related field, both from the academic but also in the grey literature (Mura et al., 2018). There is, however, a need to critically evaluate existing metrics and indexes, using the concepts of ‘alignment’, ‘deployment’, and ‘feedback’. PMM theory and popular measurement frameworks such as the Balanced Scorecard assert that metrics can form technical controls if they provide strategic ‘alignment’, ‘deployment’, and ‘feedback’ (Kaplan and Norton, 2001). For example, within an organisation, once a strategy has been created, targets and measures should be designed in alignment with such strategy, helping to deploy it across different levels and areas within the organisation (Kaplan and Norton, 2001). The company needs to focus on the indicators that matter most, collecting useful data to provide feedback to continuously develop the firm strategy. In the same vein, if sustainability-related measurement systems are to be utilised in a useful manner, they must provide ‘alignment’, ‘deployment’, and ‘feedback’

across different levels of society. These would allow ‘recursion’ to occur, i.e., indicators that are useful in the micro level are also relevant at an aggregate level. Recursion is observed in some of the most important financial metrics, such as value-added productivity, which can be calculated through firm accounts, but is also tracked at the industry, regional, and national levels (Syverson, 2011). In using such concepts, we acknowledge that environmental impact does not respect socially constructed boundaries (Whiteman, Walker and Perego, 2013), and therefore measuring and managing performance in meaningful ways requires making boundaries of analysis transparent. Finally, PMM theory argues that once we know what and how to measure, we must reflect on *how to manage* performance, by creating a shared discussion that helps the community to learn together and to continuously improve performance (Bititci, 2015).

To review the environmental sustainability-related measurement literature through the lens of PMM, our review approach is as follows. In line with problematising reviews, we read broadly but selectively. We firstly clarify *what needs to be managed* by highlighting the relevant scope of similar but different concepts such as ‘sustainability’, ‘circular economy’, ‘green’, and ‘net-zero’. This is achieved by reviewing the ‘best’ papers (assessed by citations and by journal quality) defining each concept, from the Web of Science and Scopus databases. The search period is 2015-current, acknowledging that the Paris Agreement of 2015 was an important landmark and that the field has evolved exponentially since. Subsequently, we review the ‘best’ measurement indexes (same criteria) using the lenses of ‘alignment’, ‘deployment’, ‘feedback’, ‘recursion’, and ‘boundaries’ as described previously. Finally, we problematise the literature in relation to *how to manage* such performance. Figure 1 illustrates the review approach.

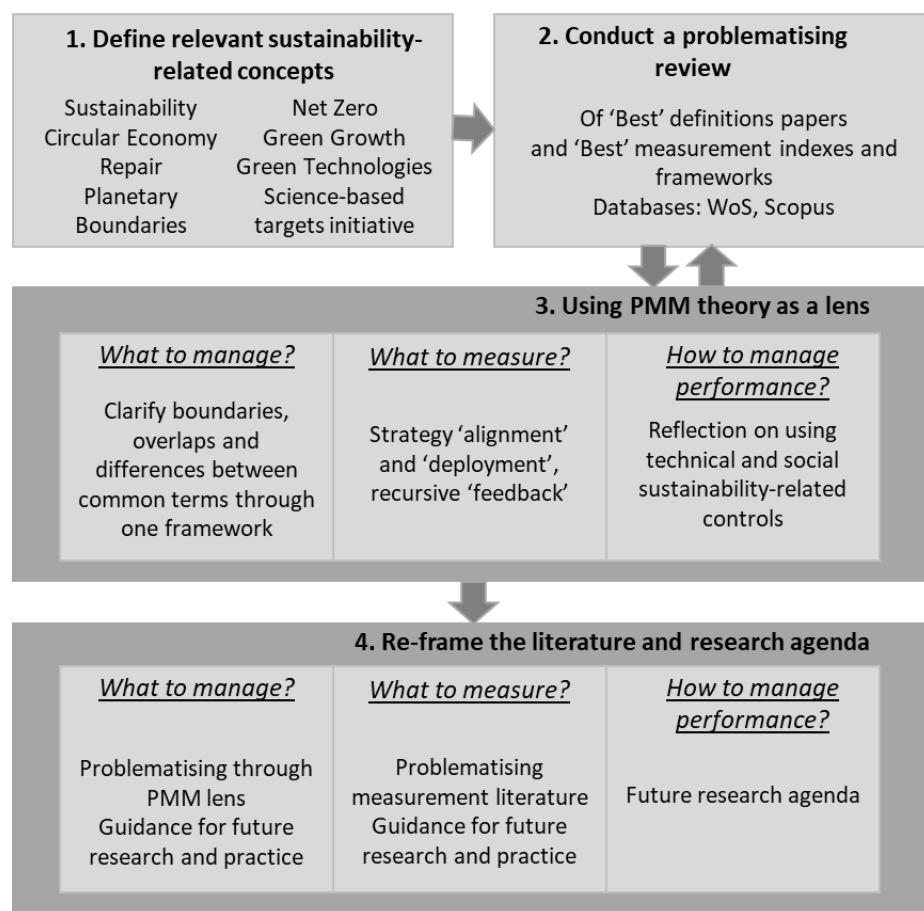


Fig 1. Review approach

3. Initial problematization of the literature

We intend to gather feedback from scholars in the PMM field regarding our methodology and initial findings during the BAM Conference 2023, when we will present an extended version of the initial developments and sections outlined below.

3.1 *What are we managing?*

Creating a shared understand of what needs to be managed is essential to improve performance (Bititci, 2015). In conducting our literature review, we acknowledge that the concepts of ‘sustainability’, ‘net zero’, ‘green growth’, ‘planetary boundaries’, and ‘circular economy’ have contested definitions. However, it is essential build an agreement (even if it represents a compromise rather than a consensus) in terms of their scope and overlaps if they are to be implemented in practice. Our review therefore starts with reviewing key papers and scoping each concept, for instance:

- Planetary Boundaries: defines a safe operating space for humanity on Earth, by outlining and monitoring nine boundaries beyond which human perturbation would significantly alter the earth system (Steffen et al., 2015).
- Sustainability: mostly defined as the Triple Bottom Line (Elkington, 2004), it emphasises the need to incorporate the planet, profit, and people perspectives into decision-making. It has developed into UN Sustainable Developmental Goals, agreed by 193 countries in 2015.
- Net-zero: Under the Paris Agreement, 197 countries have agreed to make efforts to limit global warming to 1.5 °C, which requires CO₂ emissions to peak before 2030 and fall to net zero by around 2050, meaning that any emissions released to the atmosphere would have to be captured by the same magnitude (Fankhouse, 2021).
- Circular Economy: despite being an ‘essentially contested’ concept (Korhonen et al., 2017), the most cited definition is of an economic system that replaces the ‘end-of-life’ concept with reducing, alternatively reusing, recycling, and recovering materials in production/distribution and consumption processes with the aim to accomplish sustainable development (Kirchherr, Reike and Hekkert, 2017).
- Green growth: means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies (OECD, 2018).

Based on these definitions, Figure 2 illustrates some of the overlaps and differences between the concepts, including which levels they mostly focus on.

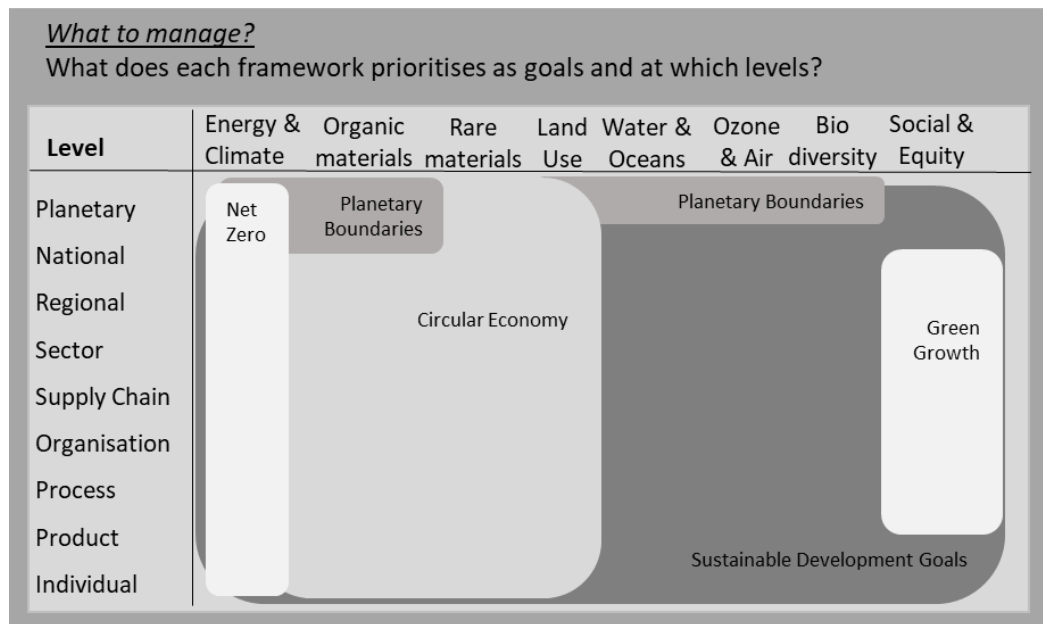


Fig 2. ‘What to manage?’ in environmental sustainability-related performance research

3.2 What to measure?

Once the scope of different terms is critically discussed, the bulk of the study critically reviews measurement. For example, in the case of the circular economy concept, many metrics and methodologies exist, for instance Material Circularity Indicator, Life Cycle Assessments and Material Flow Analysis (Saidani et al., 2019, Steffen et al., 2015). However, we review their ability to provide deployment, alignment, and feedback in a recursive way to problematise the literature, as illustrated in Figure 3.

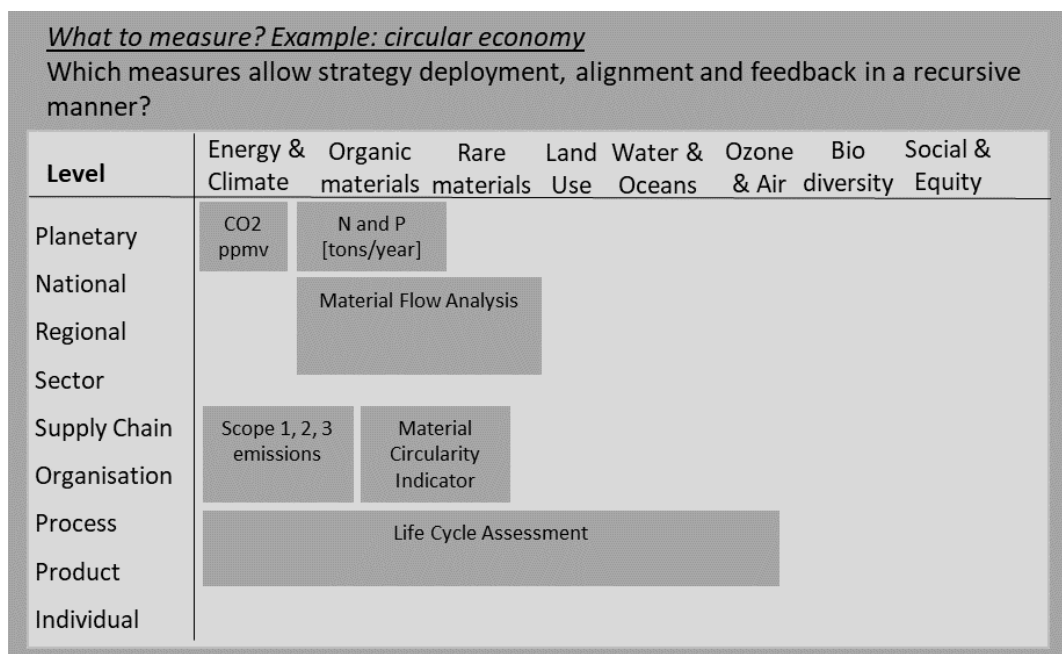


Fig 3. ‘What to measure?’ In environmental sustainability-related performance research

3.3 How to manage performance?

Whilst the field of sustainability measurement is evolving through a bottom-up approach with contributions from various fields, PMM research has previously recommended adaptations to frameworks such as the Balance Scorecard to include sustainability. This review surfaces the current problems and assumptions pertaining to the literature on how to manage sustainability-related performance. The key outcome of this section will be a re-frame of the literature to create a future research agenda for the field, which we will develop further prior to the presentation at the BAM Conference 2023.

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