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Research needs and opportunities in Context-Based Sustainability

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Abstract

In recent years, a new, literalist approach to managing the sustainability performance of organizations has emerged, the makeup of which stands in stark contrast to the prevailing, incrementalist approach. Unlike the incrementalist approach, which is predicated on the view that progress in sustainability occurs whenever marginal improvements in the social and environmental impacts of organizations are made, the literalist approach takes a more rigorous stand. Under the literalist doctrine (also known as context-based sustainability, or CBS), an organization's sustainability performance is a function of what its social and environmental impacts are relative to specific norms, standards, or thresholds for what such impacts must be in order to be sustainable. Here the literalist doctrine relies on the principle of sustainability context, or the general idea that sustainability performance assessments must be made in light of social and ecological limits, and never without them. Actual implementations of sustainability context in practice, however, are still the exception, not the rule, mainly because generally-accepted guidelines for how to do it do not yet exist. In response, this paper takes up the question of what the research and development needs and opportunities are in the field of CBS, and which must be addressed if moving sustainability context from the realm of theory into practice is to have any chance of succeeding. The authors begin by defining CBS, explaining the logic and epistemology behind it, and then continue by identi-

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fying and discussing specific issues of interest for further research and development in the social and environmental accounting domains.

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1. Introduction

In recent years, a new, *literalist* approach to managing the sustainability performance of organizations has emerged, the makeup of which stands in stark contrast to the prevailing, *incrementalist* approach. The incrementalist approach is predicated on the view that performance is mainly a function of marginal changes in the social and/or environmental impacts of an organization (Schmidheiny, 1992; WBCSD, 1999; WBCSD, 2000). Decreasing the intensity of water or energy use per unit of production in manufacturing, for example, is interpreted under the incrementalist approach as *more sustainable*. Movements in the opposite direction are seen as *less sustainable*.

The literalist approach to sustainability management (SM), by contrast, interprets performance in terms of impacts relative to specific thresholds or demarcation points for what impacts would have to be in order to be sustainable. The sustainability of water use, for example, has less to do with marginal improvements than with whether or not water use – no matter how efficient – falls within the empirical limits of supplies. Contextually relevant background conditions, therefore, matter greatly under the literalist approach, but are not at all considered under the incrementalist one.

Because of incrementalism's failure to take background social and environmental conditions explicitly into account, it has come under increasing attack (Baue 2011, 2012c; McElroy, 2012d; McElroy and Van Engelen, 2012). Indeed, how can a doctrine that purports to be about managing sustainability performance, while essentially ignoring the state or sufficiency of social and environmental resources, really be about sustainability at all? If an organization halves its water use, but is still drawing down groundwater resources at a mathematically unsustainable rate, on what basis can we say that its use of water is *more sustainable*? *Less unsustainable*, perhaps, but certainly not sustainable in any literal sense, less or otherwise.

2. The Epistemology of Sustainability

The literalist approach, then, provides us with answers to these questions by suggesting that sustainability performance is a function of what an

organization's social and environmental impacts are relative to specific thresholds. Such thresholds, the literalist doctrine suggests, represent not only empirical levels for what impacts would have to be in order to be sustainable, but norms and standards for what such impacts *ought to be* because of it. Like the incrementalist approach, the literalist doctrine views sustainable performance as a desirable state of affairs, but only the literalist approach provides specific norms, standards or thresholds for how to achieve it vis a vis the background state or quality of social and environmental resources in the world. Indeed, this is a hallmark of the literalist approach, while not being at all germane to the incrementalist one.

This takes us squarely into the field of value theory and normative propositions. From an epistemological perspective, that is, the norms we use as a basis for determining the sustainability performance of organizations can be seen as knowledge claims. They are claims about the way the world ought to be, or about thresholds that should not be crossed in terms of, say, water use; or thresholds that we should not fail to meet in the case of wages paid to employees. In other words, they amount to normative claims of one kind or another – *value claims*, that is. What, then, can their basis be? Or is one value claim just as legitimate as another, as the *relativist* doctrine suggests (Audi, 2000; Kirkham, 2001)?

Here we can turn to a *realist* epistemology (Alston, 1996; Audi, 2000; Kirkham, 2001) known as *fallibilism* (Popper, 1979[1972], 2000[1963]), according to which truth with certainty in human experience is impossible to have. There are simply too many mediating factors between the world in which we live and our own cognition of it to make such knowledge possible. These include our own senses, through which we perceive the world, but never directly. What this means, then, is that the best we can do is subject competing claims about the world to rational criticism, and then choose from among them the ones we think best survive our tests. Karl Popper referred to this as Critical Rationalism (CR), and it is the epistemology upon which the kind of literalist doctrine we subscribe to rests (Bartley, 1993[1987]; Miller, 1994; Niiniluoto, 2004[1999]; Notturno, 2001; Popper, 1979[1972], 2000[1963], 2002[1935]).

Regarding normative propositions or value claims, it is also the case, we believe, that they, too, not just *fact* claims, can be subjected to tests and evaluations as to which ones of a competing set might be more legitimate, or correct, than the others. In the domain of value claims, it is not correct *truth* we seek; rather, it is correct *legitimacy* (Hall, 1952, 1956, 1961; McElroy, 2008). A value claim, that is, is neither true nor false, but is legit-

imate or illegitimate. Fact claims are descriptive of the world, value claims are evaluative of the world; hence the two different terminologies.

Critics of the fallibilist interpretation of value theory will sometimes invoke relativism in response, or the view that values and value claims are fundamentally subjective, and therefore difficult if not impossible to defend as legitimate or correct with certainty (Audi, 2000; Kirkham, 2001). According to relativism, value claims are irreducibly normative and that is their downfall. None of this is a problem for fallibilists, however, since (a) there is no truth or legitimacy with certainty to be had in human experience in the first place, and therefore no foundations upon which they can rest, and (b) value claims are by their very nature normative. So to say that a value claim is irreducibly normative is to simply state a fact, not an argument.

Indeed, *fact* claims, too, for their part, are irreducibly *descriptive*. Should we be rejecting them, too, because of it? We don't think so. Some states of the world are simply more fit or desirable than others on objective grounds, and that is all the fallibilist approach to values is saying.

The implications of the fallibilist epistemology to the practice of SM are quite profound. No longer can objections, for example, to the absence of consensus or certainty in the specification of a norm, standard, or threshold for sustainability performance be seen as a basis for inaction. Nor can the relativist argument that one value claim is as good as another hold up. Instead, practitioners of SM are free, under the fallibilist epistemology, to formulate, test, and embrace value claims that survive their own criticism, whether or not the logic of such choices is shared by others.

The issue of certainty, for its part, is moot, since there can be no certainty in the first place under the fallibilist point of view.

When taken together, then, all of this can have a liberating effect on the degree to which organizations can feel free to move ahead with their sustainability programs in directions of their own choosing. To be sure, not everyone is yet taking a literalist approach to SM, but that is not to say that any one organization that recognizes the sense of it should not feel free to do so itself.

Note here, as well, the manner in which the fallibilist doctrine manages to avoid committing the common argumentative fallacy known as the *appeal to authority* (see, for example, Cavender and Kahane, 2010, pp. 48-52). People commit this fallacy whenever they invoke the authority of others or the majority of opinion (i.e., the consensus) as a basis for asserting the truth or legitimacy of a claim. Under the fallibilist doctrine, the truth or legitimacy of a claim has nothing to do with the plurality of opinion or the strength of credentials that line up behind it, and instead is a function of

how well it survives objective tests and criticisms on its own merits. Consensus may be nice to have, but it is not a criterion for truth, legitimacy, validity, or correctness.

None of this is to say that claims made under the fallibilist doctrine are not at all subject to rigor or criteria for what should or should not be regarded as true or legitimate. Indeed, they are. Turning once again to Popperian epistemology, we find a basis for this, known again as Critical Rationalism (CR). According to CR, the merits of a claim can be determined by how well it survives rational criticism, but never to a point of certainty. And as Popper explains, CR is just as applicable to value claims as it is to fact claims (Popper, 1971[1962], pp. 385-386):

> … nevertheless, we may take the idea of absolute truth – of correspondence to the facts – as a kind of model for the realm of standards [i.e., values], in order to make it clear to ourselves that, just as we may *seek* for absolutely true propositions in the realm of facts or at least for propositions which come nearer to the truth [since truth with certainty is not possible for us], so may we *seek* for absolutely right or valid proposals in the realm of standards – or at least for better, or more valid, proposals.

The CR expression of the fallibilist doctrine thereby provides us with just the kind of epistemology we need in the literalist form of SM to not only specify empirical thresholds for sustainability, but to also interpret them as normative standards of performance for management purposes. Such thresholds, that is, not only take the form of facts, but can also serve as norms or standards of performance that organizations can aspire to as a basis for managing and assessing their sustainability. And all of that can be done, as well, without the need for certainty, much less consensus, as a basis for taking action in SM.

3. Sustainability context

Apart from its distinctive epistemology, the key principle that lies behind the literalist approach to SM is generally known as *sustainability context*. As a concept, it is certainly not new – it has been with us for at least three hundred years (Von Carlowitz, 1713). The practice of sustainable forestry, that is – in which the rate of tree cutting in forests was systematically constrained to the rate of tree growth – was first developed and then documented by Hans Carl von Carlowitz in his seminal work, *Sylvicultura Oeconomica*, in 1713. Since then, the idea has shown up in many other

works under a variety of names (see Chapter 1 in McElroy and Van Engelen, 2012, for a historical survey of the literature in this area); but it wasn't until 2000 that it appeared in the contemporary business literature as the principle of sustainability context, per se (GRI, 2000). It was in that year that the now-predominant sustainability and reporting framework, the *Global Reporting Initiative* (GRI), was launched, in which it explicitly embraced sustainability context as a foundational principle for assessing the sustainability performance of an organization (GRI, 2011, p. 11):

> SUSTAINABILITY CONTEXT
>
> Performance information should be placed in context. The underlying question of sustainability reporting is how an organization Contributes, or aims to contribute in the future, to the improvement or deterioration of economic, environmental, and social conditions, developments and trends at the local, regional, or global level. Reporting only on trends in individual performance (or the efficiency of the organization) will fail to respond to this underlying question. Reports should therefore seek to present performance in relation to broader concepts of sustainability. This will involve discussing the performance of the organization in the context of the limits and demands placed on environmental or social resources at the sectoral, local, regional, or global level. For example, this could mean that in addition to reporting on trends in eco-efficiency, an organization might also present its absolute pollution loading *in relation to the capacity of the regional ecosystem to absorb the pollutant.* [emphasis added]

Elsewhere in its *Guidelines*, GRI adds another example involving water use, where it says (GRI, 2011, Technical Protocol, p. 6):

> [Measurement and reporting related to water consumption might be expressed] in relation to available supply in a particular location.

In both examples, there are ecological limits involved: the assimilative capacity of the environment to absorb anthropogenic wastes in the first case, and the limited rate at which freshwater resources are renewed in the second. Generally speaking, any human impacts that exceed either of these limits are seen to be empirically unsustainable in the plain-sense meaning of the term. Still, such limits are excluded by the incrementalist approach, contrary to the dictates of the world's leading international framework for corporate sustainability measurement and reporting, GRI. In light of that, we and many others have petitioned GRI (SCG, 2012) to strengthen its guidance on how to properly implement sustainability context in the forthcoming update to its Guidelines (known as *G4*).

3.1. Enter Context-Based Sustainability (CBS)

Against the backdrop of incrementalist measurement and reporting has come, as we say, an alternative approach that is literalist in its doctrine (i.e., in that it explicitly acknowledges limits and thresholds), and which is known as *context-based sustainability*, or CBS (McElroy, 2008, 2012c; McElroy and Van Engelen, 2012). The use of the term *context* in CBS is, of course, a tip of the hat to the sustainability context principle – in GRI and elsewhere – and otherwise stands for the idea that sustainability measurement and reporting must take contextually relevant social and environmental conditions in the world explicitly into account in order to be meaningful. Exactly how to do this is what we and others have been working on for several years now – and to good effect in a handful of corporate cases (see, for example, Baue, 2012a, 2012c, 2012d, 2012e; McElroy, 2012a; McElroy and van Engelen, 2012) – although there have been challenges, some of which are still with us.

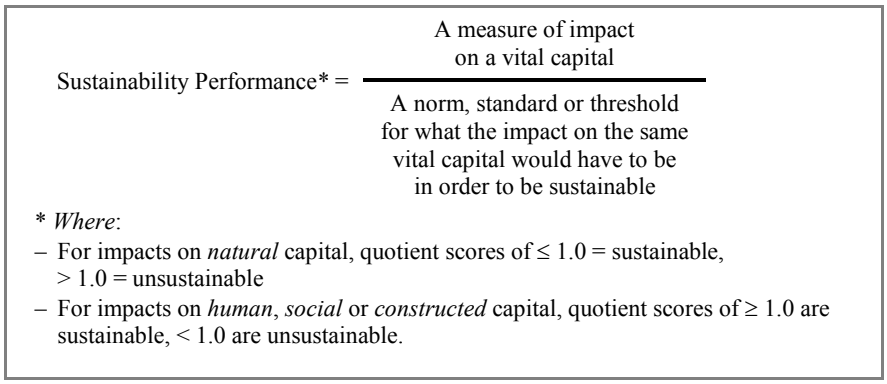
Of most importance, perhaps, to the application of any sustainability measurement and reporting system is the manner in which it goes about the process of assessing performance. Each alternative doctrine for measurement and reporting, that is, comes equipped with its own style of metrics, fashioned in the image of sustainability to which it adheres. For incrementalists, it is only marginal changes in the social and incremental impacts of organizations that matter. Thus, conventional metrics in mainstream SM take the form of absolute and relative metrics. The former measures gross impacts by organizations from one year to the next; the latter expresses the same impacts relative to some other variable of interest (e.g., water use per unit of production, per dollar of sales, or per full-time employee).

In the literalist, CBS interpretation of SM, however, conventional metrics – while no doubt useful for day-to-day management purposes – serve not as the endpoint but rather as building blocks when it comes to understanding the sustainability performance of organizations. For practitioners of CBS, an entirely new class of metric is required – one that takes contextually relevant background circumstances explicitly into account. This third type of metric has come to be known as *context-based metrics*, or CBMs (McElroy, 2011a, 2011c, 2012a, 2012b; McElroy and Van Engelen, 2012).

Context-based metrics can be (and have been) expressed in the form of simple quotients (see Figure 1), where denominators represent norms of performance grounded in contextually relevant conditions in the world (e.g., limits or thresholds pertaining to vital capital resources of some kind) and numerators represent measures of actual impacts on the same capital

resources. If a denominator expresses a rate of water use that must not be exceeded in order for an organization's use of water to be sustainable, then any actual rate of use expressed in the numerator that falls within or below that rate will signify a sustainable pattern of performance. Any computed quotient score of less than or equal to 1.0, that is, will signify sustainable performance. Any score of greater than 1.0 will signify the opposite—namely, *un*sustainable performance.

Figure 1 – Context-Based Metrics



Source: McElroy, 2008

All of the examples of limits and thresholds provided thus far have involved ecological impacts, but CBS and the context-based metrics that come with it is applicable to social sustainability performance, as well (McElroy, 2008, 2011d; McElroy and Van Engelen, 2012). Whereas ecological impacts are fundamentally about the sustainability of impacts on natural capital, the social sustainability of organizations points to their impacts on other forms of capital, specifically human, social and constructed (or built) capitals. And because these latter three types of capital are largely anthropogenic, we refer to them collectively as *anthro capitals* (McElroy, 2008; McElroy and Van Engelen, 2012). In principle, then, anthro capitals are largely human-made – not so for natural capital. Natural capital can be harnessed, harvested, and even cultivated, but not produced in any sort of materially additive way. We have one and only one Earth to work with, and no amount of technological innovation can change that.

Because of the ontological differences between natural and anthro capitals (i.e., anthro capitals are human-made, natural capitals are not), sustainability standards of performance, in terms of what impacts on each of them

must be (or not be) in order to be sustainable, vary accordingly. Impacts on natural capitals, that is (i.e., land, air, water, life, ecosystem serves), must fall within the carrying capacities of such capitals in order to be sustainable; impacts on anthro capitals, by contrast, must not fail to produce and/or maintain their capacities at levels required to meet human needs (McElroy, 2008; McElroy and Van Engelen, 2012). Sustainability thresholds for natural capital, then, are expressed in terms of *not-to-exceed* levels (i.e., ceilings); thresholds for anthro capital, however, are expressed in terms of *not-to-fall-below* levels (i.e., floors) (McElroy, 2008; McElroy and Van Engelen, 2012).

It should be clear from the discussion above, we hope, that CBS is deeply grounded in capital theory (broadly construed), and also in the view that capitals can be understood in terms of not just their volume or size (i.e., their size in terms of *stocks*), but also in terms of the size or volume of the beneficial goods and services they produce (i.e., their *flows*) (Boulding, 1966; Costanza *et al.*, 1997; Costanza and Daly, 1992; Ekins, 1992; Elkington, 1997; Fisher, 2003[1906]; Hawken *et al.*, 1999; Hicks, 1939; Meadows, 1998; McElroy, 2008; McElroy and Van Engelen, 2012; Porritt, 2005; Rockstrom *et al.*, 2009; Stiglitz *et al.*, 2009, Wackernagel and Rees, 1996). The combination of the stock and flow size of a capital can, in turn, be understood as a measure of its carrying capacity (McElroy, 2008; McElroy and Van Engelen, 2012; Sayre, 2008). In cases where we are dealing with renewable flows (e.g., water flows emanating from precipitation in a watershed, or ongoing ecosystem services emanating from a bioregion), a sustainability ethic would suggest that the underlying stocks be left intact and that human impacts be confined to the carrying capacities of the flows alone (Boulding, 1966; Daly, 1990, 1996; Wackernagel and Rees, 1996).

According to the capital-based, literalist interpretation of sustainability management, then, the sustainability performance of an organization is a function of what its impacts on vital capitals are, relative to norms, standards, or thresholds for what such impacts would have to be in order to be sustainable (Daly, 1990, 1996; GRI, 2000, 2011; McElroy, 2008; McElroy and Van Engelen, 2012). If an approach to SM cannot be expressed in these terms, then so far as we are concerned it is not SM at all. Eco-efficiency management, perhaps, or some other incrementalist doctrine, but not SM.

To help determine what the boundaries of a corporate SM program should be, we also advocate for a stakeholder-centric perspective in CBS. Indeed, in the methodology we favor for use in organizations, we start by identifying who an organization's stakeholders are (by group), and we then proceed to define norms, standards, or thresholds for what the organiza-

tion's impacts on vital capitals must be in order to be sustainable (i.e., to help ensure its stakeholders' well-being). This helps avert the possibility than an organization will somehow be expected to help solve all of the world's problems, and instead ties its accountability to only those people whose well-being is either already affected, or potentially affected, by impacts the organization is having on vital capitals, or whose well-being ought to be so affected by virtue of the relationships involved. In other words, on the one hand, organizational impacts on vital capital resources can give rise to relationships with others whose interests and well-being may be affected by such impacts; and on the other, relationships may already exist for entirely different reasons (legal, fiduciary, contractual, etc.). In either case, the relationships involved give rise to duties or obligations for organizations to manage their impacts on vital capital resources of importance to stakeholder well-being.

3.2. Specifying Standards of Performance in CBS

In order to populate denominators in context-based metrics with norms, standards, or thresholds as described above, three things need to happen. This assumes that a general duty or obligation to have impact of some kind (or not) on a vital capital has already been established. Expressing that obligation in a quantifed way is what we're talking about here.

The first thing that needs to happen is to determine whether or not the duty or obligation to have impact on a particular capital is shared or exclusive. A duty to pay employees a fair and livable wage, for example, is held exclusively by an employer. A duty to safeguard the ecological health and sufficiency of a water resource, however, is co-held by all those who use, rely upon, or have impact upon the resources involved. This helps determine an organization's fair and proportionate degree of responsibility for preserving and/or producing vital capitals, as further discussed below.

The second thing that needs to happen is that the actual or required carrying capacity of the capital resource involved (e.g., water supply, or livable wage level) needs to be determined. In the case of natural capitals, this will involve a determination of what the magnitude of the related stocks and flows are *that should be regarded as available for human use* (i.e., after taking other ecological and non-human needs into account) and preserved as such. In the case of anthro capitals, this will involve a determination of what the magnitude of the related stocks and flows are *that must be produced and/or maintained* in order to meet stakeholders' needs. In either case, sustainability *thresholds* are being defined.

The third thing that needs to happen is to take the results of the first and second determinations made above, and translate them into a proportionate *allocation* of what an organization's specific duty or obligation is to have and/or manage its impacts on the capital resources involved. This will then constitute a basis for how best to populate denominators in context-based metrics, since such duties or obligations arguably give rise to norms, standards, or thresholds for what an organization's impacts on vital capitals must be in order to be sustainable. But some further explanation of this is, of course, needed.

Using the two examples cited above (wages and water use), let's take each one and run it through our method. In the case of livable wages, we would have already determined that the responsibility for paying them belongs exclusively to the organization. We should also have taken steps to determine what the actual level of such wages needs to be in order to be sustainable. In this case, the threshold would be a not-to-fall-below one, meaning that actual wages paid should not be less than a certain level. And since the duty to pay a livable wage is held exclusively by the organization, the sum total of that obligation should be reflected in the denominator of its context-based livable wage metric. The level of actual wages paid (or the proportion of all employees who are paid at least a livable wage) would then be reported in the numerator, and the quotient score could be computed from there.

In the case involving water use, we would have already determined that the responsibility for ensuring the health and viability of the resources involved is a shared one. All users and others who may be impacting such resources are duty-bound, therefore, to be sure that their impacts do not in any way put the viability of the resources at risk, much less the well-being of those who rely on them. We would have also determined in the second step what the rates of renewable flows are from the resources in question. Making the allocation determination in the case of water, then, is more complicated, precisely because there are more responsible parties involved. The responsibility, therefore, needs to be allocated in some way to the individual parties involved; and it needs to be allocated in a fair and proportionate way. The question is, how can/should this be done?

In our work, we have devised a context-based water metric that starts by quantifying the volume of available renewable supplies in a watershed. We turn to readily available scientific sources for that[1]. We then subtract from

1. In the U.S., for example, we utilize topographical and precipitation datasets provided by the U.S. Geological Service (USGS) and the PRISM group at Oregon State University.

such supplies a volume of water that largely disappears through a process known as evapotranspiration (ET). Again, the scientific community provides us with guidance on how to do that. Next, we make an allocation of the remaining resources to non-human/ecological functions. Here again, science provides us with guidance for that (Smakhtin *et al.*, 2004). It is the remaining supplies, then (usually about 25 percent of the volumes we start with), that must be allocated to humans. We have been using two ways of doing this.

The first way is to allocate available renewable supplies on a per capita basis according to the population size of a watershed. We use Geographical Information System (GIS) tools to do this in combination with datasets taken from various governmental and scientific sources (CSO, 2012)[2]. We also have a way of translating the size of an organization into what we call its *per capita equivalent* size, so that we can more or less blend the organization into the general population. We then allocate a share of available renewable supplies to the organization according to its per capita equivalent size relative to the size of the watershed population in which it is embedded.

The second way we've handled allocations in cases like water is to do so on an economic basis (McElroy, 2012a). In that case, the mechanism we use is *contribution to GDP*. Under this method, we go through all of the same initial steps described for the per capita method (i.e., we account for ET loss, make assignments to non-human functions, etc.), but handle the final step a bit differently. First, we allocate to the general population on the basis of generally accepted norms for what a sufficient daily supply of water is per person (we have different sources for this, but have been using *75 gallons per day*); after which we then allocate the remaining balance, if any, to entities that contribute to GDP. The allocations assigned to individual organizations, then, are made according to the size of their proportionate contributions to GDP.

Here it should be clear that the allocations made under either method (per capita or economic) only affect the values shown in denominators. In either case, the values shown in the numerators (a measure of water actually consumed) are the same. The size of the allocations, however, can vary dramatically. In most cases, we have been making the allocations both ways, and are then able to look at the results from more than one perspective.

2. In the U.S., these sources include the scientific ones already cited above, and also the U.S. Census Bureau and the Bureau of Economic Analysis (BEA).

In all of this it should also be clear, we hope, that the application of thresholds and allocations as norms or standards for how best to manage and assess the sustainability performance of an organization is completely de rigueur under the fallibilist doctrine of epistemology earlier discussed. It is simply the way SM is done, ought to be done, and must be done in order to properly manage and understand the sustainability performance of organizations in authentic terms. Otherwise, there can be no standards of performance available to us in SM, and therefore no chance of managing *sustainability performance* per se, much less achieving it.

4. Challenges, needs and research opportunities in CBS

With the above background in mind, what we have before us now, in terms of the challenges we face in CBS, is that virtually no concerted research or coordination on a centralized basis has been done to establish the norms, standards, or thresholds that are so important to CBS. This is not to say that CBS is and/or will be hobbled in some way until such time as consensus has been reached on things like how much water a company should be permitted to use. Indeed, as we have already explained, we regard consensus as having nothing to do with any of this.

What we seek, instead, is nothing more than research and development around the question of what the competing value claims are, or could be, insofar as what the norms, standards, or thresholds should be for organizational impacts in many different areas of concern (i.e., social and environmental areas of impact of many kinds). What we need, that is, are sufficiently researched, developed, and vetted standards of performance that have at least survived criticism better than their competitors, and which can then be used as credible starting points for organizations interested in applying context-based sustainability to their own operations.

It strikes us, therefore, that this is precisely the kind of research agenda that may fit well within the academic community, particularly in the area of social and environmental accounting, in collaboration with the hard and soft sciences. What CBS desperately needs, that is, is a concerted effort to develop credible guidance for what the norms, standards, and thresholds ought to be in determining the sustainability performance of organizations. In some cases, this will consist of specific guidance, such as updated tables of livable wage standards for different parts of the world. In other cases, it will consist of procedural guidance for how to establish local standards that are utterly non-universal, but which should still be determined according a standardized or common method.

Likewise, the question of allocation methods stands to benefit from academic research and development. For example, the existing economic-based allocation methodology relies on GDP measures to determine proportionate shares, but it may be possible that some of the alternatives to GDP (as indicators of human well-being) are just as usable, and even preferable, in allocating rights and responsibilities in ways that are more closely aligned with true value creation—such as the Genuine Progress Indicator (GPI) (Costanza, 2009). As well, other means of allocation beyond population- and economic-based methodologies may arise from the creative wellspring of academic study and collaboration.

What CBS further requires – perhaps from the same research-based sources of performance and procedural standards described above – is a global governance function, an international focal point, similar to the role now being played by the Global Reporting Initiative in Amsterdam, that can exert guidance, oversight, and control over the development of CBS and its deployment throughout the world. Once again, it is entirely possible that both the standards-development and governance functions described above could be co-housed within the same organization or program.

4.1. The research/practice nexus in Context-Based Sustainability

Turning, next, to opportunities represented by CBS, the gaps between the current *incrementalist* practice and the burgeoning *literalist* one present significant market prospects and corresponding academic research opportunities of potentially enormous practical value. Indeed, the development of CBS to date has already been characterized by the intertwining of theory and praxis.

Ben & Jerry's pioneering implementation of the Global Warming Footprint Method, for example – arguably the first-ever implementation of a context-based approach to carbon mitigation in which a greenhouse gas (GHG) stabilization scenario was used to specify emissions reduction targets – resulted from collaboration between the company's social mission and operations teams on the practice side, and the Center for Sustainable Innovation (now called the Center for Sustainable Organizations) on the conceptualization side (Ben & Jerry's, 2006). Indeed, this served as a case study in the doctoral dissertation of this paper's co-author (McElroy, 2008).

Similarly, in 2009, BT Chief Sustainability Officer, Chris Tuppen, collaborated closely with Jørgen Randers, professor of climate strategy at the BI Norwegian Business School (and a co-author of the seminal 1972 *Limits*

to Growth study [Meadows *et al.*, 1972] that stressed the importance of ecological and social limits to economic development), to produce the company's Climate Stabilisation Intensity (CSI) methodology (Randers, 2012) that pegged emissions reductions to Intergovernmental Panel on Climate Change (IPCC) targets through 2050 (Tuppen, 2009). CSI, which clearly also resulted from a marriage of research and practice, allocates responsibilities to organizations to curb their GHG emissions at levels proportionate to their individual contributions to GDP.

Several developments cascaded from CSI's commingling of research and practice, though leaning predominantly in one direction or the other. On the research-leaning front, Prof. Randers subsequently published a paper on the CSI methodology (see again, Randers, 2012), in which he communicated the underlying concept simultaneously to academic researchers and corporate practitioners.

On the practice-leaning front, the Carbon Disclosure Project (CDP) published a report in 2009 (CDP, 2009, sponsored by BT) in which it surveyed greenhouse gas emissions reduction target-setting practices at the world's 100 largest companies. Among its findings were that "[c]ompany target setting is motivated by market forces, not scientific requirements" – in other words, targets are not context-based[3].

That same year, Autodesk used CSI as its departure point for developing its own target-setting methodology, C-FACT (or Corporate Finance Approach to Climate-Stabilizing Targets) (Stewart and Deodhar, 2009). Autodesk then made their methodology "open source" by freely and publicly sharing the underlying spreadsheets with anyone else interested in using them. One such company, EMC, then further modified C-FACT for its own purposes and has been using it ever since (Baue, 2012a, 2012d).

More recently, in September 2012, the World Business Council for Sustainable Development (WBCSD), one of the largest professional associations of major corporations practicing sustainability, and the Stockholm Resilience Centre (SRC) – a joint initiative of Stockholm University, the Stockholm Environment Institute and the Beijer International Institute of Ecological Economics at The Royal Swedish Academy of Sciences – announced a partnership to integrate SRC's research on "nine planetary boundaries" into WBCSD's Vision 2050 initiative (Bakker and Rockström,

3. Ironically, however, despite the fact that this report recommended that companies adopt science-based targets, CDP has yet to ask companies directly in its annual questionnaire whether they use science-based GHG emissions reduction targets, and if so, which GHG stabilization models they follow (Baue, 2012b).

2012). As explained in the influential 2009 *Nature* paper, "A Safe Operating Space for Humanity", lead-authored by SRC Executive Director Johan Rockström (Rockström et al, 2009), the nine planetary boundaries represent ecological sustainability thresholds, such as biodiversity loss and climate change, expressed at the global level. "For the business community in general […] there's still a lot of research to do before the main planetary boundaries can be operationalised at company level", stated Rockström, underlining the issue of *allocation* as a ripe opportunity for further research (Wijkman and Rockström, 2012).

These examples illustrate some of the interweaving dynamics of research and practice that symbiotically inform one another in the advancement of CBS. And they point to a host of additional research streams needed to continue the development of CBS as a business practice.

4.2. Research opportunities in sustainability measurement and reporting

Perhaps the most obvious "low hanging fruit" for research on context-based sustainability focuses on the roots of the concept's seminal articulation in the GRI Sustainability Reporting Guidelines, which call for the inclusion of sustainability context as a first-order principle in determining report content. However, sustainability reports almost universally exclude sustainability context, historically and currently.

"Within those reports identified as 'sustainability reports'… even those that are 'in conformance with' the Global Reporting Initiative Sustainability Reporting Guidelines provide only the most superficial data on the extent of the organization's sustainability or otherwise", state University of St. Andrews Professors Rob Gray and Jan Bebbington, both closely affiliated with the Center for Social and Environmental Accounting Research there. "Indeed, sustainability is much more likely to be entirely ignored; it is rare to see any corporation address it all. No reasonable person could make any sensible judgment on the basis of an organization's reporting in their 'Sustainability Reports' on whether or not the organization was [sustainable or] un-sustainable" (Gray and Bebbington, 2007).

So as a logical starting point, researchers could systematically survey the body (or a statistically significant sampling) of GRI-based sustainability reports seeking to identify those that have applied the sustainability context principle, either directly or indirectly. The style and manner in which such applications have occurred would be of interest, as would the manner in which sustainability performance is otherwise claimed or described in cases

where (sustainability) context is entirely missing. Patterns of practice in either case could be enormously informative.

Next, starting from existing corporate practice, researchers could focus their attention on companies currently implementing CBS to assess their relative success at achieving social and environmental sustainability, as well as the financial implications of their sustainability performance. Of course researchers could also compare and benchmark this against companies employing traditional *incrementalist* approaches to help shed light on possible causal connections, if any.

This points toward assessing the investment implications of context-based sustainability as another important frontier of research. Currently, even as the niche of socially responsible investing (SRI) shifts its nomenclature toward "sustainable investing", the field has yet to embrace a context-based approach. This may change with the 350.org divestment campaign (350.org, 2012), predicated as it is on the threshold of 565 gigatons in the world's burnable carbon budget – which is fivefold *less* than the existing fossil fuel reserves that mainstream economic logic tells us we *should* burn (Carbon Tracker, 2012). Embedded within this fact is a value proposition of *screening in*, for investment purposes, only companies that operate sustainably within our world's carbon carrying capacity (i.e., by constraining their emissions according to the logic of context-based principles).

This logic of thresholds-based investing applies not only to carbon, but carries across all sustainability impacts, suggesting a robust market for investment vehicles that depart from the *incrementalist* approach of SRI or Impact Investing to embrace a literalist approach to threshold investing. The implications for academic research abound, fueled by awards such as the Moskowitz Prize (Haas School of Business, 2012) and the IRRC Institute Award for Best Research on Post-Modern Portfolio Theory (IRRC Institute, 2012).

Further "downstream," researchers could grapple with the question of how best to assure and audit context-based sustainability reporting. While most assurance and auditing focuses on the importance of reports *getting the numbers right*, assurance and auditing of CBS reporting would focus on *getting the right numbers* – in other words, measuring, managing, and reporting on the material social, environmental, and economic impacts that determine sustainability performance in the context-based, *literal* sense of the word.

Also further along the spectrum of the value chain, academic researchers could turn their attention to implications of CBS in the "upstream" supply chain and in the area of extended producer responsibility (EPR) for the

impacts of their products (OECD, 2012). While it is true that CBS places direct accountability on organizations for their direct impacts, the current trajectory of the corporate sustainability field is also increasingly holding organizations accountable for their indirect impacts, particularly those that strictly belong to other entities up the supply chain or down the demand chain in the product distribution, sale, use, and retirement phases.

This raises confounding questions of double- (and triple- and quadruple-) counting of impacts, potentially watering down accountability by spreading it so thin. These questions currently do not have conclusive answers and solutions, making them fertile ground for further academic study and consideration. For example, the GHG Protocol is currently grappling with how its Scope 3 disclosure guidelines (GHG Protocol, 2011) apply to reporting fossil fuel reserves, with the opportunity arising to embed a context-based approach to such disclosure by linking reserves held by individual (energy) companies to their own sustainability performance and/or that of their customers.

Finally (but certainly not exhaustively), is the need for yet additional research aimed at guiding the trajectory of sustainability standards, rating systems, and analytics in the capital markets. The example of shortcomings in GRI is, unfortunately, not necessarily an anomaly. A number of other, imminent standards teeter on the verge of falling into the same incrementalist rut. The Sustainability Accounting Standards Board (SASB) in the U.S., for example, which seeks to determine materiality thresholds for sustainability reporting in 10-K and 20-F filings by publicly listed companies, has explicitly taken a stand *against* the inclusion of sustainability context in its guidance.

"Proponents of context-based sustainability argue for the measurement, management, and reporting of sustainability performance in terms of impacts on vital capital resources. This view interprets sustainability performance as a function of the impacts of an organization relative to the carrying capacity of local, regional, and global systems", states SASB on its Website (SASB, 2012).

> SASB is setting minimum standards for an entity to report material sustainability impacts in their Form 10-K or Form 20-F. The data that will be included must be of similar high quality as financial data, and auditable. **Therefore, SASB will not, as a rule, ask entities to report on the carrying capacity of local, regional, and global systems *at this time*** (SASB, 2012, emphasis added).

Hidden behind this assertion are a series of research questions: is sustainability context data necessarily of lower quality than financial data? Is it

necessarily unauditable? Or, flipping the question on its head, does a context-free approach to sustainability denude the term of its core meaning?

Similarly, the International Integrated Reporting Council (IIRC), which seeks to set standards and guidance for integrated reporting that merges financial and sustainability data and discussion, is taking a multiple-capitals approach, which predisposes it to align with a context-based approach to sustainability (IIRC, 2012). However, this overlap does not guarantee that IIRC will ultimately adopt a context-based approach, exposing the standard to the risk of embracing an incrementalist approach. The research question arises: can one embrace a multiple-capitals approach to measuring sustainability without also addressing the sufficiency of the stocks and flows involved—or is this intellectually untenable?

Unlike SASB and IIRC, the Global Initiative for Sustainability Ratings (GISR), which seeks to establish standards and certification for organizations that rate, rank, and index corporate sustainability, explicitly includes sustainability context as one of its five core Principles (GISR, 2012). Sustainability ratings have evolved into the "tail that wags the dog", as companies typically monitor their performance on ratings, and often modify and tailor their practice to improve their performance on ratings as a way to bolster their reputations.

As is, the vast majority of sustainability raters take an incrementalist approach, which means that the raters collectively incentivize incrementalist behavior, essentially undermining timely achievement of the goal of sustainability. One rater, Climate Counts (which scores corporate performance on GHG emissions reductions), has announced a pilot project for 2013 integrating a literalist context-based approach by measuring corporate emissions reductions against a science-based GHG stabilization model (Bellamente, 2012).

Academic research could examine this correlation between ratings and corporate performance, to explore the degree to which the tail may indeed wag the dog – and if so, whether the tail is encouraging desirable wagging or not. Obviously, this latter line of inquiry steps into the realm of value claims, and thus would need to ground itself in the epistemology outlined above.

Clearly, the literalist approach of context-based sustainability presents a wealth of research opportunities to the academic community. What's most promising is the synergy and interdependence between the academic and practitioner communities, which all too often work in isolation from one another. As the father of Stakeholder Theory, Ed Freeman, recently stated in a presentation, "Business school research is pretty much irrelevant to

business now – managers don't give a damn about the cutting edge of management theory" (Freeman, 2012). Research on context-based sustainability could flip this equation on its head by creating a symbiotic relationship between business and research, whereby each benefits from the work of the other, creating mutual benefit – or dare we say "shared value" (Porter and Kramer, 2006, 2011) – for the world at large.

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