Social footprints

McElroy, M.

SOCIAL FOOTPRINTS

Measuring the social sustainability performance of organizations

Mark W. McElroy

Rijks*universiteit* Groningen

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Measuring the social sustainability performance of organizations

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to my friend Donella H. Meadows and all that she stood for,
and to my family, and theirs, and theirs, and theirs.....

Preface

The thesis put forward on these pages is the improbable, if not unintentional, result of a ten-plus year effort to explore the connections between sustainability and epistemology. I can easily trace the genesis of my work, first and foremost, to the late Donella H. Meadows (Dana), whose many conversations with me (and powerful writings) on the challenges of sustainability (or unsustainability) in the conduct of human affairs provoked an irresistible desire on my part to get to the bottom of things, as it were. Whether or not I have managed to do so is, of course, debatable. In any case, it is to Dana's memory, and in recognition of her contributions to humanity and to the field of sustainability, that I dedicate this thesis. Her influence on my intellectual development was profound, and I thank her for that.

I say my thesis is improbable and unintentional because the confluence of sustainability and epistemology so prominently featured in it was, in large part, an accident. It only occurred to me long after I had, first, devoted myself to learning as much as I could about sustainability - for purely personal reasons - and then, second, immersed myself in the subjects of knowledge management and epistemology - for purely professional reasons. It was not as if I had developed a theory or hypothesis from the start on how epistemology can be employed as the key to sustainability, and then set out to test and evaluate it in some preconceived way. Rather, it was only after I had developed some understanding and skill in epistemology (which followed my study of sustainability) that I realized, or discovered, that the former could be applied to the latter; and that sustainability management, measurement, and reporting is so deeply grounded in the business of making knowledge claims; and that the science of making such claims, therefore, can be harnessed in the service of sustainability - to advance it, that is, in unforeseen ways.

This leads me to my second expression of thanks, which is to Joseph M. Firestone, who almost single-handedly taught me epistemology over a ten-year period, as if I were his private student and the world depended on it. His incredible patience and generosity in this regard was a gift I daresay I shall never be able to repay, although he has my eternal gratitude, friendship, and respect. What I

learned most from Joe was how to appreciate the power and importance of fallibilism as a management tool - a la Karl Popper's epistemology - and that people can make both fact and value claims in non-relativistic terms. Moreover, Joe taught me that action can be taken on the basis of knowledge that has merely survived our tests and evaluations without the need for consensus, much less the possibility of certainty. Once Joe's arguments had sunk into my thinking, I can honestly say that the world changed for me, and that I never looked back. Otherwise intractable problems, such as humanity's sustainability crisis, suddenly seemed less daunting to me, the effects of which were liberating, almost euphoric - like being able to see clearly for the very first time, having lifted the fog, so to speak.

Next in my journey came another unexpected turn: my introduction to the University of Groningen, and to Professors René J. Jorna, Jo M. L. van Engelen, and Dr. D. J. Kiewiet there. Professors Jorna, van Engelen, and I would first cross paths in 2002 in The Netherlands, where I had the pleasure of speaking at a conference on sustainable innovation led by the two of them. Afterwards, the three of us and Dr. Kiewiet would meet in the spring of 2005 for more intense discussions at a small colloquium organized for that purpose at Dartmouth College. Others who would attend that meeting included Joseph M. Firestone, Professor Steven A. Cavaleri of Central Connecticut State University, and Professor Benoit Cushman-Roisin of Dartmouth. I am especially grateful for the role Professor Cavaleri played, before, during, and after that meeting, in helping me to better understand the fields of system dynamics and organizational learning. And I thank Professor Cushman-Roisin, as well, for his unremitting rigor in critiquing the quantitative and assertive side of my thinking, and for his contribution of office space at Dartmouth where I did some of my work. All of these contributions were of tremendous help in the development of my thesis, and I thank everyone named above, one and all, for their kindness and generosity.

Shortly after our 2005 meeting at Dartmouth, I was offered a position at the University of Groningen as a Visiting Researcher, and was accepted as a doctoral candidate there, as well - a possibility that would never have even occurred to me only six months earlier. I cannot begin to express my gratitude to the University for allowing me to step into its program, and to Professors Jorna and van Engelen, in particular, for having sufficient faith in my abilities to suggest as much, and to serve as my promoters. I thank them both sincerely for the opportunity they have given me. And I thank them, as well, for the respectful manner in which they allowed me to pursue my ideas on a largely self-directed basis, even as they would gently steer me back on course when I occasionally strayed.

And I thank them, too, for the rigor and attention to detail they brought to the process. My work and my thinking are better off because of it.

I also want to thank Dr. D. J. Kiewiet, who later joined Professors Jorna and van Engelen as a co-promoter of my thesis, when it became clear that I would need more support on the statistical, methodological, and validation sides of my effort. It is hard to imagine having gotten though this experience without the aid of his prodigious skills in these areas, and I thank him for that.

Also key to my progress were the contributions of two others, whose work with me on the campus at Dartmouth would prove very beneficial in the end. First was the assistance of Lee Fisher, who in the summer of 2006 worked with me as an intern, while pursuing his own MBA at the Warwick Business School in the UK. Lee's work with me in developing some of the early applications of the Social Footprint Method would later pay dividends, as I found myself fine-tuning the Wal-Mart and Ben & Jerry's cases described in this thesis. Equally valuable was the help I received from Professor Matissa Hollister in the Sociology Department at Dartmouth, whose impressive skills and experience in the quantitative analysis of social data helped steer me through a statistical thicket or two, as I was working on the Ben & Jerry's case. Thank you Professor Hollister and Lee Fisher, both, for your invaluable assistance.

Next I want to acknowledge the influence of the many interactions I had with other students, faculty, and staff members at the University of Groningen, whose feedback, comments, and reviews of my work over the past three years have been instrumental to my thinking. Of particular note has been the role played by Niels Faber, Henk Hadders, and Kristian Peters, whose own interests have perhaps been closest to mine. I am also deeply grateful for the considerable assistance Niels and Kristian provided in helping me to prepare for my defense. I could not have done it without them.

In addition to Niels, Henk, and Kristian, I also want to thank Laura, Joost, Rob, Janita, Jesus, and Marjolein for the various roles they played in helping to test, evaluate, and contribute to my thinking. And so, too, do I want to thank Sonja Abels and others in the secretarial staff at the University, who always helped me with my travel arrangements, and made me feel so much at home whenever I was in Groningen. And how can I possibly thank Henny Wever at the University enough, for her incredible contribution of time, patience, and skill to the process of formatting and producing the document you now hold in your hands? Thank you Henny for that, and thank the rest of you for everything.

I’d also like to express my appreciation to Rob Gray, Bert de Vries, Alan AtKisson, and Markus Milne, who in addition to several of the folks already mentioned above, participated in a face validity survey on the Social Footprint Method - the results of which are discussed in this thesis. Thank you all for your thoughtful comments, and for taking my work seriously enough to get involved.

Finally, I want to thank my family, especially my wife, Amy, for putting up with what must have, at times, seemed like a curious, and protracted, case of mid-life crisis - as perhaps it was. To be sure, this work would not have been possible without her active support and tolerance for the commitment of time and resources it would take for me, and her, to see this project through. She, too, in her own way, had a hand in this, and I will always be grateful for that.

Mark W. McElroy
Thetford Center, Vermont, July 4, 2008

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GLOSSARY

Anthro Capital	A category of anthropogenic (i.e., human-made) vital capitals, consisting of human capital, social capital, and constructed (or built) capital.
Anthro Economic Capital	A subset of Anthro Capital consisting of vital human, social, and constructed (or built) capitals required to ensure basic human economic well-being.
Binary Performance Scale	A reporting system for plotting the results of Full-Quotient (or Quotients-Based) Sustainability Measurement and Reporting efforts, according to which human impacts on vital capitals are scored and interpreted as either sustainable or unsustainable.
Capital	A stock of anything that yields a flow of beneficial goods or services into the future - as required by humans and/or non-humans for their well-being (Costanza et al, 1997; Porritt, 2005).
Carrying Capacity	The extent to which the flows of beneficial goods or services from a stock of capital can satisfy a population's basic needs - usually expressed in terms of the maximum size of the corresponding population that can be so supported by such flows.
Constructed (or Built) Capital	Material objects and/or physical systems or infrastructures created by humans for human benefit and use; the world of human artifacts, in which human knowledge is also embedded. Constructed capital includes instrumental objects, tools, technologies, equipment, buildings, roads and highway systems, power plants and energy distribution systems, public transportation systems, water and sanitation facilities, telecommunications networks, homes, office buildings,

	etc. (Daly, 1973, 1977; Daly and Cobb, 1989; Costanza et al, 1997).
Corporate Responsibility (CR)	A management discipline synonymous with Corporate Sustainability Management (see below), although sometimes confined to either social or environmental concerns, only.
Corporate Social Responsibility (CSR)	A term originally coined by the World Business Council for Sustainable Development (WBCSD, 1999) and defined as follows: "Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large."
Corporate Sustainability Management (CSM)	A management discipline that focuses on measuring, managing, and reporting the overall sustainability performance of a company, usually in terms of the Triple Bottom Line, but not always.
Denominator-based Sustainability Measurement and Reporting	Same as Full-Quotient (or Quotients-Based) Sustainability Measurement and Reporting (see below).
Eco-efficiency	An alternative, numerator-only approach to sustainability (see below) originally put forward by the World Business Council for Sustainable Development (Schmidheiny, 1992), which explained the term as follows: "Industry is moving toward 'demanufacturing' and 'remanufacturing' - that is, recycling the materials in their products and thus limiting the use of raw materials and of energy to convert those raw materials [...] That this is technically feasible is encouraging; that it can be done profitably is more encouraging. It is the more competitive and successful companies that are at at the forefront of what we call 'eco-efficiency'."

	Eco-efficiency strives for reductions in energy and material throughputs in human enterprise, although not in any standards-based sense. Thus, it is entirely possible for an organization to show progress in eco-efficiency even as it simultaneously experiences declines in sustainability.
Ecological Capital	Same as Natural Capital (see below).
Ecological Footprint Method	A full-quotient-type approach for measuring and reporting the ecological impacts of a human collective (on Natural Capital), developed by William Rees and Mathis Wackernagel (1996). Takes (ecological) Sustainability Context fully into account.
Ecological Quotient	A variant of the Sustainability Quotient intended for use in measuring and reporting an organization's (or other human collective's) Environmental (or Ecological) Bottom Line, as an element of its overall (Triple Bottom Line) Sustainability Performance.
Economic Bottom Line	A component of the Triple Bottom Line; a measure of the economic sustainability performance of a company. Sometimes confused with the financial performance (or bottom line) of a company, the Economic Bottom Line is more a measure of an organization's impacts on Anthro Economic Capital in the communities in which it operates; one of the things the Social Footprint Method was designed to compute.
Environmental (or Ecological) Bottom Line	A component of the Triple Bottom Line; a measure of the environmental (or ecological) sustainability performance of a company. The kind of thing the Ecological Footprint Method was designed to measure.

Full-Quotient (or Quotients-Based) Sustainability Measurement and Reporting	An approach to measuring and reporting the sustainability performance of an organization (or human collective) that measures impacts on vital capitals (quantified in numerators) against norms or standards of performance for what such impacts ought to be (quantified in denominators). The Social and Ecological Footprint Methods are examples of this.
Human Capital	Individual knowledge, skills, experience, health, and ethical entitlements that enhance the potential for effective individual action and well-being (Mincer, 1958; Schultz, 1961; Becker (1993[1964]).
Knowledge	Beliefs or claims consisting of two types: knowledge of facts and knowledge of values (Hall, 1952, 1956, 1961; Popper, 1971[1962]; McElroy et al, 2006). Fact knowledge consists of descriptive beliefs or claims about the world (the way it is), which have survived our tests and evaluations and which may help us to adapt; value knowledge consists of evaluative or normative beliefs or claims about the world (the way it is or ought to be), which have survived our tests and evaluations and which may help us to adapt (McElroy, 2003; Firestone and McElroy, 2003a).
Natural Capital	Defined by Hawken, Lovins and Lovins (1999) as: "…the sum total of the ecological systems [including life itself] that support life, different from human-made capital in that natural capital cannot be produced by human activity."
Numerator-Only Sustainability Measurement and Reporting	An approach to measuring and reporting the sustainability performance of an organization (or human collective) that measures actual impacts on vital capitals, while failing to take norms or standards of performance for what such impacts ought to be into account. Eco-efficiency as an approach to sustainability is one such example.

Social Capital	Shared knowledge and organizational resources (e.g., formal or informal networks of people committed to achieving common goals) that enhance the potential for effective individual and collective action and well-being in human social systems (Coleman, 1988, 1990; Putnam, 2000; Ostrom and Ahn, 2003; McElroy et al, 2006;).
Social Bottom Line	A component of the Triple Bottom Line (see below); a measure of the social sustainability performance of a company. One of the things the Social Footprint Method was designed to compute.
Social Footprint Method	A full-quotient-type approach for measuring and reporting the social and economic impacts of a business (on anthro capital), developed by the Center for Sustainable Innovation. Takes (social and economic) Sustainability Context fully into account.
Societal Quotient	A variant of the Sustainability Quotient intended for use in measuring and reporting an organization's (or other human collective's) Social or Economic Bottom Line, as elements of its overall (Triple Bottom Line) Sustainability Performance.
Sustainability	The subject of a social science that studies human impacts on various kinds of capital (natural, human, social, and constructed), relative to norms for what such impacts ought to be in order to ensure human well-being.
Sustainability Context	Defined by the Global Reporting Initiative (GRI, 2006) as an account of "economic, environmental, and social conditions, developments, and trends at the local, regional, or global level" against which organizational sustainability performance should be measured and reported. GRI adds: "This will involve discussing the performance of the organization in the context of the limits and demands placed on environmental and social resources at the sectoral, local, regional, or global level."

Sustainability Performance	A measure of an organization's (or human collective's) impacts on vital capitals, relative to their effects on human well-being; based on norms for what such impacts ought to be in order to ensure human well-being.
Sustainability Quotient	A design specification for a measurement model that can be used to measure and report the Triple Bottom Line Sustainability Performance of an organization, or other human collective.
Sustainable	An adjective indicating a state of affairs in which human activities on various kinds of capital conform to norms for what such impacts ought to be in order to ensure human well-being.
Quotients-based Sustainability Measurement and Reporting	Same as Full-Quotient (or Quotients-Based) Sustainability Measurement and Reporting (see above).
Triple Bottom Line (TBL)	An organizing principle introduced by John Elkington in 1998, which refers to the measurement, management, and reporting of corporate performance, in terms of a social bottom line, an environmental bottom line, and an economic bottom line.
Vital Capitals	Types of capital required for basic human well-being, the absence or insufficient quality or supply of which can put such well-being at risk. In sustainability theory and practice, such capitals generally consist of natural or ecological capital, and anthro capital (i.e., human, social, and constructed capital).

CHAPTER 1

INTRODUCTION

1.1 MOTIVATION

In recent years, an exciting new branch of management has emerged. Variously known as Corporate Social Responsibility (CSR), Sustainability Management, Corporate Citizenship, or just Corporate Responsibility (CR), this new field is best referred to, in our view, as Corporate Sustainability Management, or CSM.

Here we note that we are not alone in taking a sustainability-oriented view of the field. In its fifth *International Survey of Corporate Responsibility Reporting 2005*, the international consultancy KPMG made the following observation (p. 4):

> "A dramatic change has been in the type of CR reporting which has changed from purely environmental reporting up until 1999 to sustainability (social, environmental, and economic) reporting which has now become mainstream among G250 companies (68%) and fast becoming so among N100 companies (48%)."

To be clear, CSM is a school of management theory and practice that:

1. begins with recognition that businesses and other types of organizations can, and do, have a broad range of non-financial impacts in the world, and
2. that such impacts can and should be managed. Indeed, many of the ills in the world are arguably attributable to the behaviors of business, as are many of the positive things people value, such as employment, income, personal growth and achievement.

Together, such ancillary, non-financial impacts of business are referred to in the lexicon of CSM as externalities, a term borrowed from economics. An externality, in economics, is defined as (Oxford Dictionary of Economics, 1997 Edition):

> "A cost or benefit arising from any activity which does not accrue to the person or organization carrying on the activity. External costs or diseconomies are damage to other people or the environment, for example by radiation, river or air pollution, or noise, which does not have to be paid for by those carrying on the activity. External benefits or economies are effects of an activity which are pleasant or profitable for other people who cannot be charged for them, for example fertilization of fruit tress by bees, or the public's enjoyment of views of private buildings or gardens."

The goal of CSM, of course, is to manage organizational impacts in the world such that they are socially and environmentally responsible. That, at least, is the expectation increasingly being placed upon businesses by society, in response to which a growing number of companies are establishing and maintaining CSM functions every year.

Despite the very positive trend of increasing business commitments to CSM, the state of the art in terms of how CSM is performed is still in its infancy. Of particular relevance to this thesis is the manner in which organizations measure and report, or assess, their actual non-financial impacts in the world as a basis for taking related actions. Indeed, in order to manage its externalities effectively, an organization must have a solid grasp of what its impacts in the world actually happen to be. Yet mainstream tools and methods designed to produce this kind of information usually fail to deliver, for reasons we will explain in the next section below.

That, then, is the principal motivating factor behind this thesis: to rectify a serious deficiency in the manner in which organizations measure and report their own sustainability performance, and by doing so to make a valuable contribution to the exploding new field of CSM. The contribution we purport to make is a new CSM measurement and reporting methodology called the Social Footprint Method (SFM). Whereas other CSM methods focus on measuring the ecological sustainability of organizations, our focus will be on measuring their social sustainability.

1.1.1 The state of sustainability theory and practice

Before we introduce the method, we must first set the stage by calling attention to:

1. the concept and state of human well-being,
2. basic terms and principles in the field of sustainability,
3. the resulting inadequacy of mainstream CSM methodologies to properly measure and report the sustainability performance of organizations, and
4. the role of knowledge and epistemology in related schools of thought.

1.1.1.1 Human well-being

The particular orientation to sustainability we have taken in our development of the Social Footprint Method is one that is grounded in the concept of human well-being, and the need to achieve and maintain it in order to create and sustain peaceful and satisfactory conditions in society.

Before we turn to some current sources for insight as to what the state of the world may actually be, it should be useful to stop and consider for a moment what is meant by the phrase *human well-being*. McGillivray and Clarke provide a very useful discussion of the subject in their book, *Understanding Human Well-Being*, in which they first call attention to the ambiguity of the term (2006, p. 3):

> "Human well-being, however, is an ambiguous concept. It lacks a universally acceptable definition and has numerous, often competing, interpretations [...] Further, terms such as quality of life, welfare, well-living, living standards, utility, life satisfaction, prosperity, needs fulfillment, development, empowerment, capability expansion, human development, poverty, human poverty, and, more recently, happiness are often used interchangeably with well-being without explicit discussion as to their distinctiveness."

The authors go on to make the very important point that despite differences in how various scholars define well-being, most agree that it cannot be directly measured, and that indicators, therefore, are required to monitor and keep abreast of it. While most such indicators in the past were of an economic sort, many con-

temporary indices have broadened to include non-economic aspects of human life, including capabilities, agency, and functionings (Sen, 1984, 1985a, 1985b, 1987a, 1987b, 1987c, 1999, 2006), Nussbaum's central human capabilities (1988, 1992, 2000), Doyal and Gough's (1991) intermediate human needs, and Narayan et al's (2000) axiological needs. Importantly, the authors further point out that issues "such as gender and sustainability have also become increasingly integrated within human well-being analysis" (McGillivray and Clarke , 2006, p. 4).

Dasgupta (2001), however, observes that income "continues to be regarded as the 'quintessential' well-being indicator" (p. 53). Many analysts tend to equate human welfare with material wealth. Accordingly, various economic metrics such as Gross National Product (GNP), Gross Domestic Product (GDP), or income per capita are frequently used to assess and report the general well-being of people in national settings. As McGillivray and Clarke point out, however, "the limitations of income-based (or consumption-based) measures of human well-being are well known, including limitations around equity, environment and its own construction" (2006, p. 4; see also Clarke and Islam, 2004, for a summary).

In response to the perceived limitations of such uni-dimensional indicators, another class of composite indicators has emerged over the years, including the UNDP's Human Development Index (HDI), the UN's *Millennium Development Goals* (MDGs), the UN's *Commission on Sustainable Development* (CSD) indicators, the World Bank's World *Development Indicators* (WDIs), and many others. Some sources have even gone so far as to combine aspects of multiple indices into meta-indices. Cherchye and Kuosmanen (2006), for example, combine aspects of 14 well-known indices into a single, synthesized sustainability index.

Separate and apart from the kind of *objective* indicators discussed above has recently come an entirely new and different class of *subjective* schemes (McGillivray and Clarke, 2006, pp. 4-5). Such subjective schemes tend to focus on happiness as the principal indicator of well-being, including consideration of "cognitive judgements of life satisfaction and effective evaluations of emotions and moods" (McGillivray and Clarke, 2006, p. 4; see also: Diener, 1984; Argyle, 1987; Diener and Larsen, 1993; Eid and Diener, 2003). One particularly extensive index, or database, of subjective happiness, the *World Happiness Database* (Veenhoven, 2004), contains 2300 surveys from 112 countries, dating from as far back as 1946 to the present day.

We provide the brief summary of human well-being indices above for background purposes only, and not because we intend to study them closely or choose from among them for our own purposes. Nor do we intend to develop our own competing index. Rather, we will be making reference to one or more of these indices in the pages that follow, as we attempt to illustrate the various conditions or dimensions in society that businesses and other types of organizations can have impact on, and the manner in which third-party measures can be used to classify and understand them. Our goal, however, will be to remain neutral on the question of which sustainability or human development index ought to be used in a given context, since it is our intent to provide a measurement solution, or template, for determining the social sustainability of organizational operations that can be used with any one of them.

Before we move on, let us take a moment to consider what some of the indices mentioned above are actually telling us about the world we live in today. Perhaps the most influential, if not dominant, set of standards and indicators for human development is the UN's Millennium Development Goals (MDGs) program. In total, there are eight MDGs:

1. Eradicate extreme poverty and hunger;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat HIV/AIDS, Malaria and other diseases;
7. Ensure environmental sustainability;
8. Develop a global partnership for development.

By far the most common, and arguably serious, concern expressed by the various indices discussed above is what the MDG program lists as its number 1 Goal: the eradication of extreme poverty and hunger in the world, and the effects that a failure to do so has on the other Goals listed. Indeed, all of the eight Goals listed in the MDG program are deeply intertwined, with the state of any one of them being contingent upon the status of the others.

The UN's MDG campaign is administered by the United Nations Development Programme (UNDP). Each year, the UNDP publishes a report on progress made towards achieving the Goals. The first Goal (i.e., eradicating extreme poverty and hunger) is expressed in terms of two specific targets:

1. Halve, between 1990 and 2015, the proportion of people whose income is less than one dollar a day, and
2, Halve, between 1990 and 2015, the proportion of people who suffer from hunger.

Here is how the world was doing, as of 2006, in terms of achieving that Goal and its two targets, as reported in the *Millennium Development Goals Report* published by the UNDP in the same year (2006b, p. 4):

> "In 1990, more than 1.2 billion people - 28 per cent of the developing world's population - lived in extreme poverty. By 2002, the proportion decreased to 19 per cent. During that period, rates of extreme poverty fell rapidly in much of Asia, where the number of people living on less than $1 a day dropped by nearly a quarter of a billion people. Progress was not so rapid in Latin America and the Caribbean, which now has a larger share of people living in poverty than South-Eastern Asia and Oceania. Poverty rates in Western Asia and Northern Africa remained almost unchanged between 1990 and 2002 and increased in the transition economies of South-Eastern Europe and the Commonwealth of Independent States (CIS). These two regions had previously nearly eradicated the worst forms of poverty, and recent survey data suggest that their poverty rates are again dropping. In sub-Saharan Africa, although the poverty rate declined marginally, the number of people living in extreme poverty increased by 140 million. Many sub-Saharan countries are now showing potential for long-term growth that could bring up standards of living."

Here is the summary on progress made towards achieving the hunger target (2006b, p. 4):

> "Chronic hunger - measured by the proportion of people lacking the food needed to meet their daily needs - has declined in the developing world. But progress overall is not fast enough to reduce the number of people going hungry, which increased between 1995-1997 and 2001-2003. An estimated 824 million people in the developing world were affected by chronic hunger in 2003. The worst-affected regions - sub-Saharan Africa and Southern Asia - have made progress in recent years. But their advances have not kept pace with those of the early

> 1990s, and the number of people going hungry is increasing. Of particular concern is Eastern Asia: in the early 1990s, the number of hungry people declined; but again it is on the rise."

Turning to the UNDP's *Human Development Report*, in which the *Human Development Index* is published each year, we find (in the 2006 edition) the following general assessment (UNDP, 2006a, p. 263):

> "Over the past decades there have been unprecedented increases in material wealth and prosperity across the world. At the same time these increases have been very uneven, with vast numbers of people not participating in progress. Mass poverty, deeply entrenched inequality and lack of political empowerment contribute to deny a large share of the world's population the freedom to make real choices. Moreover, GDP is still measured in a way that does not take into account environmental degradation and the depletion of natural resources."

Apart from the moral and ethical arguments that can be made for the alleviation of human suffering in the world, there are practical ones as well. As Jeffrey D. Sachs of the Earth Institute in New York put it in his book, *The End of Poverty* (2005, p. 1):

> "The $450 billion that the United States will spend this year on the military will never buy peace if it continues to spend around one thirtieth of that, just $15 billion, to address the plight of the world's poorest of the poor, whose societies are destabilized by extreme poverty and thereby become havens of unrest, violence, and even global terrorism."

In this regard, we can say that human policies, or behaviors, that tolerate extreme poverty are unsustainable; they are unsustainable in the sense that they erode and undermine human security, and thereby put human well-being at risk. Meadows et al express this idea in compelling terms in their 1992 sequel to their 1972 book, *The Limits to Growth*, as follows (1992, pp. 210-211):

> "A sustainable society would not freeze into permanence the current inequitable patterns of distribution. It would certainly not permit the persistence of poverty. To do so would not be sustainable for two reasons.

> First the poor would not and should not stand for it. Second, keeping any part of the population in poverty would not, except under dire coercive measures, allow the population to stabilize. For both moral and practical reasons any sustainable society must provide material sufficiency and security for all."

Returning to our main thesis, which concerns the manner in which organizations - *businesses*, in particular - can measure and report their impacts on society as they attempt to increase their positive externalities and decrease their negative ones, one of the several human well-being indices discussed above, the UN's Millennium Development Goals program, has explicitly hit upon the idea that businesses, not just governments, can in fact make contributions towards achievement of the Goals. By the same token, the UN claims that businesses can benefit from getting involved with the Goals, not just the reverse. In *Business and the Millennium Development Goals: A Framework for Action* (Nelson and Prescott, 2003), the UN makes its case as follows (p. 4):

> "...there are three broad reasons why it makes sound business sense to contribute towards the achievement of the Millennium Development Goals. Each of these is a crucial pillar for building successful and competitive private enterprises:
>
> - First, investing in a sound environment in which to do business;
> - Second, managing the direct costs and risks of doing business;
> - Third, harnessing new business opportunities."

The report goes on to explain how businesses have impact on the Goals and affect development as follows (Ibid, p. 5):

"Most companies have some impact on development and can make a contribution in the following spheres of influence:

- Their core business activities - in the workplace, the marketplace and along the supply chain;
- Their social investment and philanthropy;
- Their engagement in public policy dialogue and advocacy activities.

These three spheres of influence form the basis of our *Framework for Action* throughout the report."

Here it should be clear that organizations can have impact on alleviating human suffering in the world, either as a direct consequence of their core business activities, or as an indirect consequence of making contributions in other ways. Helping to achieve the Millennium Development Goals is one of them. Indeed, all indications suggest that as businesses around the world increasingly take up the task of measuring, reporting, and managing their social and environmental impacts, expressing such impacts in terms of their effects on achieving the Millennium Development Goals will be common practice. Green Mountain Coffee Roasters, for example, a publicly-traded company in the United States, recently listed the following policy decision in its 2005 *Corporate Social Responsibility Report* as one of several notable accomplishments it made that year (2006, p. 10):

> "***A new social and environmental bottom line:*** We made the decision to align the work of our social responsibility initiatives and programs with the United Nations' Millennium Development Goals (MDGs). We have committed to measuring ourselves based on how well we support MDG #1 - reducing poverty and hunger - and #7 - ensuring environmental sustainability."

Another company, ABN AMRO, in its 2004 *Sustainability Report*, made a similar pronouncement (2005, p. 10):

> "...it is our firm belief that the business community has a crucial role to play in achieving the UN Millennium Development Goals. Our contribution will be mainly in the area of poverty alleviation (microfinance), education (social and community investment), protecting the environment (building our sustainable business processes and risk management framework) and developing and strengthening international trade and financial systems (our emerging markets and risk advisory services."

Exactly how Green Mountain Coffee Roasters and ABN AMRO will measure their impacts on achieving the MDGs is unspecified and remains to be seen. Indeed, methodologies for measuring the social and environmental impacts of corporations in the world are still very much in their infancy, and, as we have alleged and will explain later on, are largely inadequate, too.

Still, organizations have much to offer and the need for adequate tools and methodologies for assessing their impacts is great. But until and unless companies

have accurate means of measuring their impacts on society and the environment, we cannot expect their related management efforts to be as effective as they could be. To be effective, managers involved in such efforts must first be informed about what their organizational impacts in the world already happen to be. Otherwise, they are flying blind.

All of this presupposes, of course, that it makes sense to focus our sustainability improvement efforts on businesses as opposed to other kinds of social or political collectives in the world. This, in fact, is simply a choice we have made. It is not to say that other avenues or strategies for intervening in the global conduct of human affairs should not be pursued at the same time (by others), or that such alternative strategies are not worth pursuing.

Rather, for us, the corporate arena is simply one that we have chosen to focus on because of the potential it represents and the need it displays for advances in CSM tools and methods. Indeed, corporations are uniquely qualified, with their resources and global reach, to steer human civilization towards sustainability (Hart, 1997; Adams et al, 2004).

Corporations also happen to be centers of growing political and economic power. As Gray and Bebbington (2005, p. 1) put it:

> "It seems incontrovertible that, in the absence of a fundamental change in the political will of governments (especially those of the developed world), any serious examination of sustainability and how it might be achieved must have the corporation at its heart."

Once again, it is the purpose and motivation of this thesis to develop a tool for measuring and accurately reporting the social sustainability performance of organizations, and of corporations, in particular. It is the very absence and need for such a tool that motivates and inspires us, therefore, to make a material contribution to the development of the new CSM school of management. In that way, we also hope to do what we can to foster and facilitate the improvement of human conditions in the world, the current state of which is so disturbingly portrayed by the various indices of well-being we have touched on.

1.1.1.2 Sustainability terms and principles

In the preceding section, we declared our affinity for a sustainability interpretation of what may be more generally referred to as the field of Corporate Responsibility. Opponents to our inclusion of the term sustainability in the phrase, *Corporate Sustainability Management,* or CSM, will say, either that we are biasing an otherwise more broadly defined field to the narrower realm of sustainability theory, or that the term sustainability itself is so ambiguous and ill-defined as to be meaningless.

To the first accusation we plead *guilty as charged*. It is absolutely our intent to approach the field of Corporate Responsibility, or Corporate Social Responsibility - however one wishes to put it - from a sustainability perspective. This is because we think *sustainability* is precisely what the *responsibility* issue boils down to in all cases.

To be responsible is to embrace a particular strategy, or means, for achieving sustainability as an end. We embrace responsibility not only because we believe it is the right thing to do, but also because we believe that not doing it is self-defeating. To be irresponsible is to undermine our own well-being, and that, in the plainest sense of the term, is unsustainable.

Indeed, speaking in terms of sustainability allows us to put a finer point on the concept of responsibility, and removes the haze of ambiguity that otherwise envelops the field. Thus, it helps bring clarity to a field (Corporate Responsibility, or Corporate Social Responsibility) that is in desperate need of it, and which is still trying to find its way in the world - a world in which the conduct of human affairs is arguably unsustainable, and in which the well-being of humanity tends to suffer accordingly.

As to the second charge, we agree that there is a kind of definitional crisis afflicting the field of sustainability management. The term is indeed ambiguous, and many people use it in many different ways (see, for example, Daly, 1973, 1977, 1996; Pearce et al, 1989; Meadows et al, 1992; Wackernagel and Rees, 1996; Elkington, 1998; Henriques, 2001; Willard, 2002; Porritt, 2005; Princen, 2005; Faber et al, 2005; Jorna, 2006). Princen, in particular, describes the situation as follows (2005, p. 30):

> "The many uses and abuses, the lack of consensus on a single meaning, and the incessant bickering about what sustainability really is have led many to give up on the term. As if to throw up their hands in exasperation, they dismiss it as yet another buzzword, a term rendered meaningless through overuse and co-optation."

We believe this difficulty has more to do with a lack of rigor than with ambiguity. People can easily formulate a plain sense definition of the term, and doing so would clearly serve a useful and important purpose in terms of helping us to describe and understand real conditions in the world - conditions, that is, that are sustainable in some cases, and unsustainable in others.

In recent years, the multiplicity of competing definitions for the term *sustainability* has arguably narrowed (Pezzey, 1989; Pearce et al, 1989; Rees, 1990; Lélé, 1991; Stern, 1997; Dresner, 2006), culminating in a synthesis of theories and a consensus surrounding what some refer to as the *capital theory approach* (CTA) to sustainability (Stern, 1997, p. 145):

> "The large number of definitions of sustainability proposed in the 1980s has been synthesized into a smaller number of positions in the 1990s [Tisdell, 1988; Pearce et al, 1989; Rees, 1990; Simonis, 1990; Lélé, 1991; Costanza and Daly, 1992; Pezzey, 1992; and Toman et al, 1994]. There is agreement that sustainability implies that certain indicators of welfare or development are non-declining over the very long term; that is, development is sustained (Pezzey, 1989). Sustainable development is a process of change in an economy that does not violate such a sustainability criterion. Beyond this, the dominant views are based on the idea of maintaining a capital stock as a prerequisite for sustainable development."

Here it is important to point out that capital, in the sustainability literature, usually refers to non-financial assets or resources that are productive. We embrace this general sense of the term, expressed by Costanza et al as follows (1997, p. 107):

> "...a stock [*of anything*, in line with Porritt, 2005, p. 112] that yields a flow of valuable goods or services into the future. What is functionally important is the relation of a stock yielding a flow; whether the stock is

> manufactured or natural is in this view a distinction between different kinds of capital and not a defining characteristic of capital itself."

In this thesis, we will also be using a term from ecology, *carrying capacity* (Odum, 1983), to refer to the level of needs a stock of capital can support, given the volume of goods or services it can produce (Randers and Meadows, 1973). In that regard, when we say that a stock of capital is sufficient in size to produce a flow of goods or services to meet the needs of a human population, we will be saying that its carrying capacity is sufficient. And when we say that a human activity is sustainable, we will mean that its impacts on capital are such that it either does not diminish, or succeeds in creating and/or maintaining, sufficient levels of related carrying capacities.

Related to all of this are two broadly divergent views on what the CTA approach to sustainability might mean in practice. Referred to as the *strong sustainability* versus *weak sustainability* schools of thought, they generally differ on the question of how much capital of one sort or another can be consumed or destroyed relative to the remaining supplies of others, while still maintaining human and ecological well-being. The disagreements between them turn on the issue of *substitutability*, or how much of a loss of natural capital can be substituted, or compensated for, by another type of capital (i.e., artificial or human-made capital).

Strong sustainability theorists hold to the notion of no, or low, substitutability between natural and artificial capitals (Daly, 1973, 1977, 1996; Daly and Cobb, 1989; Costanza et al, 1997; Dresner, 2006; Ekins et al, 2002). Weak sustainability theorists contend, by contrast, that human-made capitals, such as technology and other anthropogenic innovations, can, with few exceptions, be substituted for natural capital, and that independently managing and maintaining separate capital stocks is unnecessary. Instead, they argue, it is the overall size, or aggregate, of all capitals that must be maintained in order to safeguard human and ecological well-being (Pearce et al, 1989; Gutés, 1996).

Much less specific, and yet more influential, is perhaps the most often quoted definition of the term *sustainability*, the so-called Brundtland definition, put forward in 1987 by the World Commission on Environment and Development (also known as the Brundtland Commission) in its report entitled, *Our Common Future*. There, the term sustainable development was famously defined as follows (1987, p. 8):

> "Humanity has the ability to make development sustainable - to ensure that it meets the needs of the present without compromising the ability of future generations to meet their own needs."

It is indeed ironic that what is so often referred to as the most influential or authoritative definition of *sustainability* is arguably not a definition of sustainability at all. Rather, it is a definition of 'sustainable development', in which the notion of *sustainability* is used as an adjective, and in which the subject is *development*. Thus, it is a definition of a type of development that leaves open the question of how the adjective it uses is, or should be, defined. As a putative definition of *sustainability*, then, the Brundtland contribution fails to deliver.

In this thesis, we embrace the CTA approach, notwithstanding the differences between its strong and weak adherents. Indeed, as will become clear later on, such differences between sub-schools of thought in the CTA approach to sustainability are of little consequence to the use of the method we are proposing. The Social Footprint Method is indifferent to such distinctions, and is of equal value and use to both sides of the CTA debate as we will show.

CTA, however, is not completely free of problems. Of main concern is its myopic focus on ecological, or natural, capital. While it is true that CTA does take other forms of capital into account, it:

1. only does so in the context of debating how substitutable they may or may not be relative to natural capital, and
2. is incomplete in its treatment of them. Nowhere in CTA, for example, do we see mention of human or social capital. These and other problems with CTA are addressed in our thesis.

In sum, our method is predicated upon acceptance of the CTA school in general. That, and other key conceptual commitments to sustainability theory we have made in this thesis are as follows:

1. Sustainability is a concept that refers to an aspect of the relationship between people - and, in particular, their *behaviors* or *activities* - and various types of capital that people rely on for their well-being, especially natural (or ecological), human, social, and constructed capital (we will refer to the latter three types as *anthro capital*).

2. Capital is "a stock [of anything (Porritt, 2005, p. 112)] that yields a flow of valuable goods or services into the future" (Costanza et al, 1997, p. 107). Capital is not to be confused with the flows it produces.
3. The extent of human and/or non-human needs that a flow of goods or services yielded by capital can support is referred to as its *carrying capacity*. A given population of humans in an organization or social system will have a corresponding need for carrying capacity at some level, a level required to meet basic human needs. The carrying capacity of a stock of capital can either match, fall below, or exceed such needs. Similarly, the needs of a human population for capital-based resources or services can either match, fall below, or exceed available levels of carrying capacity in both natural and anthro capital.
4. Importantly, anthro capital, unlike natural capital, can be created by people. That is, it is *anthropogenic capital* (see, for example, Schultz, 1961; Coleman, 1988; McElroy et al, 2006); hence our use of the term *anthro capital*.
5. Human activities in a social system are sustainable if they do not diminish the stocks of capital required to produce a flow of goods or services needed to meet basic human needs, or if, in the case of anthro capital, they do not fail to create and/or maintain such stocks. Human activities which have the effect of diminishing stocks of capital below needed levels, or which fail to create and/or maintain them, in the case of anthro capital, at required levels, are unsustainable.

1.1.1.3 A methodological gap

Despite the widespread consensus behind the CTA theory of sustainability, no sustainability measurement, accounting, or reporting systems - also known as *non-financial reporting* - have been developed, or systematically applied, to operationalize the theory in any sort of comprehensive way (Adams et al, 2004, p. 20). It is our intent, therefore, to fill that gap.

Notwithstanding the above, it is true that various attempts have been made over the years to popularize the CTA approach, or to implement parts of it in practice. In 1998, for example, Elkington coined and defined the phrase, *triple bottom line* (TBL), as follows (Elkington, 1998, p. 70):

> "Today we think in terms of a 'triple bottom line,' focusing on economic prosperity, environmental quality, and - the element which business had preferred to overlook - social justice."

In his 1998 book, Elkington, like us, is clearly concerned with the measurement of sustainability performance in organizational or business settings, only. To that end, he goes on to explain his three bottom lines in terms of impacts that corporations can have in each of the three areas. And he does so by making explicit use of CTA-type language: Economic Capital, Natural Capital, and Social Capital (Elkington, 1998, pp. 74-92). Indeed, for Elkington, the TBL is all about corporate impacts on three types of capital. That much is clear.

Still, while Elkington can easily be credited with having single-handedly popularized the CTA approach to sustainability in the form of his TBL metaphor, he never really provided us with a tool, or an accounting instrument, to go along with the concept. That would come later, when others would take up the challenge of how to operationalize the TBL, or the CTA more generally, into an executable or instrumental form.

By far and away the most successful implementation of TBL/CTA-type sustainability reporting is the Global Reporting Initiative (GRI). GRI is both an organization and a method, which together have attracted a growing list of corporations interested in measuring and reporting the triple bottom line impacts of their operations to stakeholders of all walks. According to GRI, over 1700 organizations around the world have committed to the use of GRI for annual sustainability reporting (Grist, 2006).

Notwithstanding the progress made in corporate sustainability measurement and reporting over the years, and the associated uptake of CTA theory that has accompanied it, there is a problem in sustainability reporting that must be resolved if we are to make any real progress in improving the performance of business. Indeed, for all of the talk of TBL reporting, corporate responsibility, and sustainability measurement and accounting, the leading CSM method in the world, GRI, arguably fails to do precisely the one thing it purports to do, which is make it possible to measure and report on an organization's non-financial sustainability.

GRI comes up short in this regard by virtue of its failure to adhere to its own theoretical foundations. While it faithfully sticks to Elkington's three bottom lines in

its structure and orientation (and the CTA theory that lies behind them), it falls well short of actually measuring, not to mention reporting, impacts on the capitals involved. Instead of measuring capital impacts against capital constraints, limits, or standards, GRI merely measures impacts against the same impacts in a time series or trend-lining fashion. While it is true that GRI argues for more than this by advocating for the inclusion of 'sustainability context' in related reports, it provides no specific guidance for how to do so, nor have we ever seen a GRI report with such context included.

Table 1.1 Excerpt from 2006/2007 GRI Sustainability Report*

EN16 - Total direct and indirect greenhouse gas emissions by weight			
EN4 and EN16	**2006/2007[1]**	**2005/2006**	**2004/2005**
electricity consumption (tons of CO_2)[2]	19.43	35.09	35.19
heating consumptions (tons of CO_2)[3,4]	12.19	*24.44*	*24.44*

[1] Includes the data for half of the reporting period (July 2006 - December 2006). Data for 2007 is not yet available (see EN4 for more details).
[2] Emissions factor used provided by GRI's energy supplier for 2006: 447.331515414666g/ kWh
[3] Emissions factor 1.974 kg/m^3 provided by GHG Protocol Initiative is used.
[4] Data on usage of natural gas for heating is available only as a total amount for period from October 2002 to December 2006. Consequently, average consumption of heating is diplayed here to project the generation of CO_2 emissions caused by heating in the period.

data includes the consumption of energy by the GRI Secretariat's office

** source: GRI Sustainability Report 2006/2007*

Even GRI itself, in its one and only sustainability report issued thus far, fails to include sustainability context in its disclosures. As shown in Table 1.1, for example, GRI's reporting of its greenhouse gas emissions are presented in precisely the time series or trend-lining fashion we describe, without any mention of associated context, which in this case would consist of something like the assimilative capacity of the atmosphere to absorb such emissions. Thus, we are able to see what GRI's emissions were, but we have no way of putting them into context, much less to form conclusions as to what GRI's sustainability performance was in the years described.

In their present, conventional form, then, GRI-type reports are analogous to bank statements that only record deposits and withdrawals, but which fail to include

mention of starting and ending balances. Because of this, GRI is perhaps best described as an illustration of *triple top line* reporting, not *bottom line* reporting. By preventing stakeholders who rely on it to determine an organization's impacts on the viability of vital capitals, GRI fails to support them (the stakeholders) in their most basic attempts to understand whether or not their organizations' activities are, in fact, sustainable. It (GRI) is the leading sustainability reporting method in the world, and yet it fails to perform this most basic function!

Not all contemporary sustainability measurement and reporting methods fail to deliver, however, as GRI does. One in particular, the *Ecological Footprint* (Wackernagel and Rees, 1996), not only quantifies top-line impacts, but also measures and reports such impacts against natural capital conditions in the world. Thus, turning again to our banking metaphor, the Ecological Footprint not only tells us how much our deposits and withdrawals have been, it tells us so in the context of our starting and ending balances, and thereby makes it possible for us to determine whether our rate of spending is itself sustainable.

Despite its more faithful adherence to the CTA approach and the manner in which it makes true bottom-line accounting possible, the Ecological Footprint is:

1. strictly limited to analyses of impacts on natural capital only, and
2. rarely used by organizations.

Most of what we see in the form of Ecological Footprint analyses is performed at the level of regional or national human populations (i.e., *physical* aggregates of humans), as opposed to organizational populations (*conceptual* aggregates).

1.1.1.4 Knowledge and epistemology

In this thesis, we take the position that sustainability measurement and reporting invariably reduces to a process of creating and asserting knowledge claims - claims about the sustainability performance of organizations. Of particular importance is the distinction we can make between descriptive claims about an organization's actual performance, and normative claims about what such performance ought to be (see Sections 1.3 and 2.3 below). We will argue that in order for sustainability measurement and reporting to be meaningful, related assertions

must include claims of both kinds; if they do not, they will fail to serve their purpose.

Indeed, claims regarding actual performance, made in the absence of claims regarding normative performance, suffer from a fatal lack of context, and thereby tell us little about the true sustainability performance of the organizations they pertain to. This, unfortunately, is all too often the case, including for most of what passes for mainstream sustainability measurement and reporting today, as our analysis will show. It is by taking such a knowledge-based, epistemological approach to sustainability that a solution can be found, however, as we will demonstrate in Chapters 2, 3 and 4 in the development of the Social Footprint Method.

1.1.2 Implications for sustainability performance

In order to be sustainable, organizations must have access to information about what their operational impacts in the world actually happen to be. But as we have seen from our discussion above, this is precisely what the leading CSM method in the world, GRI, fails to provide. As Gray and Milne put it (2002, p. 5), "whilst a GRI-influenced report might approach a triple bottom line report, it is highly unlikely to ever be a sustainability report."

How, then, can we expect organizations to function in sustainable ways in the absence of such information, or in the absence of feedback concerning the effects of their own actions? The answer, we believe, is *we can't*. Unless and until mainstream CSM methods make it possible to express organizational impacts in terms of their effects on the sufficiency of capital stocks and flows, sustainability management, per se, will not be possible, much less practiced.

Gray and Bebbington (2005) take an even more critical stance. In their view, it is not just the inadequacy of sustainability reporting that is the problem, it is the fact that corporations, by their very nature, cannot be sustainable in the first place. Contemporary methods for measuring and reporting the sustainability of corporate operations, they argue, merely mask and make all the more inevitable the devastating effects of their dysfunction. In a stinging rebuke of GRI sustainability reports and others like it, the authors say (p. 7):

> "No reasonable person could make any sensible judgement on the basis of an organization's reporting in their 'Sustainability Reports' on whether or not the organization was un-sustainable. Given that research has also shown that the attestation or assurance statements which attach to these reports are also, at best, useless and, at worst, highly misleading we are left with a major international initiative with considerable resources behind it which has little more than hubris, smoke, mirrors and deceit to offer society."

The same authors go on to conclude the necessity of bona fide sustainability reporting at the corporate level of analysis if society is to make any headway in reforming the status quo. Here they echo our own thoughts as to the strong need for accurate and meaningful reports as a necessary precondition for achieving sustainability in the conduct of human affairs (Ibid.):

> "The tragedy is not just that such extensive resources are used to mislead and deceive society. The real tragedy is that if sustainable business organization is ever to be achieved, then societies, individually and collectively, need to know [the extent to which] corporations, with the very best will in the world, are not capable of delivering sustainability. It is this - accountability for the extent to which a corporation cannot be sustainable, socially responsible and/or environmentally benign - that is the real potential of corporate reporting. Only then can societies learn whether or not:
>
> 1. it is necessary to reform the corporation and/or
> 2. it is possible for the corporation to reform itself and/or
> 3. as we reluctantly suspect, we face a systemic problem and unsustainability lies at the very heart of our current advanced form of international financial capitalism. Our failure to develop substantive sustainability reporting prevents us from addressing these entirely crucial matters."

We agree with these sentiments, although we are not necessarily as quick to conclude that our current international system is beyond repair, or as systemically dysfunctional as Gray and Bebbington seem to suggest. This is all the more reason, we think, to accelerate the process of creating precisely the kinds of tools and methods we need to get to the bottom of the issue.

1.1.3 The need for effective tools and methods

Assuming managers in organizations (with the support of their stakeholders) in fact have a desire to function sustainably, the situation described above is untenable - untenable even in the absence of such conditions. Not only are businesses qualified and equipped to tackle intractable problems of sustainability, they are very often the causes and perpetuators of them as well. Thus, it is important that managers in corporations have access to meaningful and reliable information about their organizations' impacts in the world, both for the sake of prevention and in support of remediation initiatives available to them.

Turning back to GRI, the leading CSM method in the world, there is some cause for optimism, or hope, in terms of where that method may be heading. In both the latest and previous versions of the method ('G3' and 'G2', respectively), an acknowledgement has been paid to the importance of what is referred to as *sustainability context* in the preparation of corporate CSM reports. G3 reads as follows (GRI, 2006, p. 13):

> **"Sustainability context**
>
> *Definition:*
>
> The report should present the organization's performance in the wider context of sustainability.
>
> *Explanation:*
>
> Information on performance 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.
>
> This concept is often most clearly articulated in the environmental arena in terms of global limits on resource use and pollution levels. However, it can also be relevant with respect to social and economic objectives such as national or international socio-economic and sustainable development goals. For example, an organization could report on employee wages and social benefit levels in relation to nation-wide minimum and median income levels and the capacity of social safety nets to absorb those in poverty or those living close to the poverty line. Organizations operating in a diverse range of locations, sizes, and sectors will need to consider how to best frame their overall organizational performance in the broader context of sustainability. This may require distinguishing between topics or factors that drive global impacts (such as climate change) and those that have more regional or local impacts (such as community development). Similarly, distinctions might need to be made between trends or patterns of impacts across the range of operations versus contextualizing performance location by location."

Notwithstanding this apparent nod to the importance of tying corporate impacts to their effects on the sufficiency of vital capitals in the world, GRI's guidelines fail to provide what is ultimately needed: a detailed method or procedure for doing so. The latest guidelines, G3, offer no prescriptive means whatsoever as to how to actually take *sustainability context* into account, and every GRI report that we have ever seen, before or since, is entirely devoid of context. Until this changes, users and readers of such reports will be condemned to ignorance on what the true sustainability performance of the described organizations may or may not be. It should come as no surprise to anyone, therefore, if performance actually worsens over the years, despite the presence of such reports.

There are currently no corporate sustainability reporting methods in use today that make sustainability measurement and disclosure possible in any sort of literal, multi-capital, CTA-based way. Once again, the leading method, GRI, is at best described as a *triple top line* method, and offers no insight whatsoever as to

what the capital impacts of organizations that use it might be. Thus, it fails as a bona fide sustainability measurement tool. And other tools, such as the Ecological Footprint (discussed in Chapter 3), while they do address impacts on natural capital, fail to address the *other* bottom lines, so to speak, and are therefore too narrow in scope to address the whole problem.

What CSM practitioners need now, then, is a comprehensive CTA-based approach to non-financial reporting, and in particular new tools that make the measurement of impacts on non-natural, non-financial capitals possible. When combined with similarly-constructed tools, such as the Ecological Footprint, that already make such non-financial impacts on natural capital understandable, we will have at least an entry-level, and complete, multi-capital set of corporate sustainability measurement tools at our disposal. Only then can we expect the actual sustainability performance of businesses to improve, because for the first time managers in such organizations will have access to information as to what their actual impacts on the sufficiency of vital capitals is, and how far away their organizations might be from where such impacts ought to be.

1.2 THE SOCIAL FOOTPRINT

The Social Footprint Method (SFM) is our response to the question of how to measure the social sustainability performance of an organization, or to compute a social bottom line, as John Elkington might put it (Elkington, 1998).

The SFM differs from all other attempts or methodologies aimed at measuring the social sustainability of organizations in at least the following three ways:

1. It measures the social sustainability impacts of organizations against standards for such impacts. Thus, it is not just a top-line or trend-lining method, as GRI is.
2. The social sustainability standards against which the impacts of an organization are measured are expressed in terms of impacts on capitals. The SFM is, in that regard, a product of the CTA school of thought, and is an attempt to operationalize CTA (and, more broadly, the triple bottom line) in a practicable form. The particular forms of vital capital addressed by the SFM are human capital, social capital, and constructed capital. We refer to these three types of non-financial, non-natural capitals as *anthro*

capital, because they are human-made, or anthropogenic (see, for example, Schultz, 1961; Coleman, 1988; McElroy et al, 2006).

3. The specific kinds of impacts on anthro capital that the SFM measures and accounts for are impacts on their *carrying capacities*. Thus, the standards of performance we use in assessing the social sustainability of organizations are standards of carrying capacity in anthro capital, at levels required to meet the basic needs of a population. Impacts that have the effect of meeting or exceeding such standards are treated as sustainable. Impacts that have the opposite effect are treated as unsustainable.

In practice, the SFM takes the form of an arithmetical quotient. Below we introduce the theoretical basis of this idea, and the manner in which it can be applied to both ecological and non-ecological contexts.

1.2.1 Sustainability quotients

As noted above, the SFM is based on the simple idea of comparing organizational performance, or impacts on anthro capital, with related standards of performance, or standards for what such impacts ought to be. We further contend that such sustainability performance can be expressed quantitatively in the form of a quotient, where the numerator is an organization's actual impact on capital and the denominator is the standard or norm for what such an impact ought to be. While similar constructions have been developed by others in ecological contexts (Wackernagel and Rees, 1996), no one has yet done so for cases involving social contexts. That is what we purport to do here.

In our attempt to develop a social sustainability measurement model, as opposed to an ecological one, we found it necessary to step back and specify a theoretical framework that would capture and express the CTA-based notion of sustainability in more general terms for both social and non-social (or ecological) purposes. This was due to the fact that we could find no such practicable formulations of CTA in the literature. Once we had formalized CTA in such broad or generic terms, we were then able to develop the social instantiation of it we were looking for.

In the process of filling this gap, we developed a framework that can arguably be applied to other domains, such as the ecological one, and even the financial or economic ones. In that regard, the *sustainability* quotient is a design specification for sustainability metrics of many kinds, since it operationalizes a broad theory of sustainability (CTA), not just a theory of *social* sustainability.

Other sustainability measurement and reporting methods, including GRI, when viewed from the perspective of our quotients approach, can be seen as numerator-only schemes. In other words, they report performance in terms of actual impacts on the world without attempting in any way to compare or measure such impacts against standards, thresholds, context, or normative considerations of any kind.

In sum, the logic of sustainability quotients is simply this: that the sustainability of a behavior is best determined by comparing its impacts with *standards* for what such impacts ought to be (i.e., by comparing actuals with normatives). Impacts that violate standards for what such impacts ought to be are unsustainable; impacts that conform to such standards are sustainable.

1.2.2 The Ecological Footprint

The Ecological Footprint (Wackernagel and Rees, 1996) is, in some respects, the inspiration for the Social Footprint Method we develop in this thesis. What the Ecological Footprint Method (EFM) showed was that the impacts of human activities on a type of capital - natural capital, in the case of the EFM - could be measured and expressed in quantitative terms, and then compared to a standard for what such impacts ought to be.

While not explicitly cast or expressed in terms of sustainability quotients per se, the EFM does rely on a quotients approach to assessing the sustainability of a human population. It does this by relying, at least implicitly, on both a numerator and a denominator. Consider the following explanation put forward by the EFM's creators (Wackernagel and Rees, 2006, p. 56):

> "As noted previously, the fundamental ecological question for sustainability is whether stocks of natural capital will be adequate to meet anticipated demand. Ecological Footprint analysis approaches this question

> directly. It provides a means to compare production by the ecosphere with consumption by the economy, thereby revealing whether there is ecological room for economic expansion or, on the other hand, whether industrialized societies have overshot local (and global) carrying capacity. In the latter case, the Ecological Footprint also reveals the sustainability gap confronting society. In short, Ecological Footprint analysis can help to determine the ecological constraints within which society operates; to shape policy to avoid or reduce overshoot; and to monitor progress towards achieving sustainability."

In the statement above, there is an implicit quotient being referred to by the authors. Specifically, the phrases 'production by the ecosphere', 'ecological room for economic expansion', 'carrying capacity', and 'ecological constraints' all refer to a denominator in a sustainability quotient which specifies limits (ecological ones, in this case) against which actual performance or impacts in the world can be compared. The numerator, through which such impacts are expressed, is referred to in the statement above by the phrases 'anticipated demand', 'consumption by the economy', and 'economic expansion'.

1.2.3 Societal quotients

As we have shown, the Ecological Footprint Method relied at least implicitly on a quotients approach to the measurement and reporting of sustainability. Moreover, its emphasis was on ecological issues only; or on the impacts of human activity on natural capital. Because natural capital is limited, measuring and reporting the sustainability of human activity in that context necessarily entails the measurement of performance against limits or constraints.

This is fundamentally not the case, however, when it comes to measuring human performance against impacts on anthro capital. Unlike natural capital, anthro capital is theoretically unconstrained, since it is produced by humans who can almost always create more of it, if and when they choose to do so.

As noted above, we define anthro capital as consisting of three types of human made, or anthropogenic, capital, vitally important to the well-being of people on earth. Here, briefly, is how we define these three types of capital:

1. *Human Capital*
   Human capital consists of *individual* knowledge, skills, experience, health, and ethical entitlements that enhance the potential for effective individual action and well-being (Mincer, 1958; Schultz, 1961; Becker, 1993[1964]).
2. *Social Capital*
   Social capital consists of *shared* knowledge and organizational resources (e.g., formal or informal networks of people committed to achieving common goals) that enhance the potential for effective individual and collective action and well-being in human social systems (Coleman, 1988, 1990; Putnam, 2000; Ostrom and Ahn, 2003; McElroy et al, 2006).
3. *Constructed Capital*
   Constructed capital (or 'built' capital) consists of *material objects and/or physical systems or infrastructures* created by humans for human benefit and use. It is the world of human artifacts, in which human knowledge is also embedded. Constructed capital includes instrumental objects, tools, technologies, equipment, buildings, roads and highway systems, power plants and energy distribution systems, public transportation systems, water and sanitation facilities, telecommunications networks, homes, office buildings, etc. (Daly, 1973, 1977; Daly and Cobb, 1989; Costanza et al, 1997).

In our approach, we take the position that anthro capital yields goods and services that people rely on - *and which they appropriate* - in order to take (what is hoped to be) effective action in the service of their own well-being. In some cases, such action is taken individually, while in others it is taken collectively. In all cases, though, it is action taken using capital-sourced goods and services in order to ensure human well-being.

Managing stocks of anthro capital is therefore important to human well-being. Unlike natural capital, however, which exists in fixed supplies on earth, anthro capital is not fixed in supply, and is produced by humans. People teach and learn, and thereby create human capital; they form social, economic, and government bonds and thereby create social capital; and they build highways, office buildings, schools, shopping centers, factories, and material products and technologies, and thereby create constructed capital.

In the case of ecological capital, then, our problem is that we have *too much demand* relative to fixed supplies. So we must focus on measuring *demand* and *lowering* it. In the case of anthro capital, however, our problem is not that we have too much demand, it is that we have *too little supply*. We can take this position, since in the case of anthro capital, supplies are not fixed; rather, because they are anthropogenic, we can always make more of them. Thus, when confronted with *social* unsustainability, we must focus on measuring *supply* and *raising* it.

This difference in perspective on how to view human impacts on natural versus anthro capital gives rise to a difference in how we should attack the measurement problem in the design of the two, respective footprint methods. As we have already discussed, the Ecological Footprint is set up to compare the use of resources with corresponding limitations in capital. A Social Footprint, by contrast, must hold human actors accountable to the levels of capital they produce. The resulting ecological and societal quotients we can construct will differ, accordingly.

We will have much more to say about our societal quotients, the scores they produce, and how to interpret and work with them in Chapters 3 and 4. For now, however, suffice it to say that we believe we can construct sustainability quotients that quantitatively express the social sustainability performance, or bottom line, of an organization, in much the same way as others have done in the ecological domain. While there are important differences to contend with, the principles in both cases are the same: human impacts are measured and expressed in terms of their effects on the sufficiency of vital capital, norms and standards for which must be an integral part of any CSM reporting system.

1.3 EPISTEMOLOGY

The Social Footprint Method (SFM) is, at base, an epistemological tool. Its purpose, that is, is to produce knowledge about the sustainability, or sustainability performance, of an organization. In that regard, it is a knowledge production tool that organizations can use in support of their attempts to manage their social impacts in the world.

Epistemology, however, is not a unified field. There are many different branches of epistemology, and competing points of view within them (Kirkham, 2001; Audi, 2000). Because of this, it is important that we disclose our own orientation, and the particular theories of knowledge and truth that we subscribe to.

1.3.1 Facts, values, and fallibilism

In this thesis, we will rely heavily on the distinction between knowledge of facts and knowledge of values (Hall, 1952, 1956, 1961; Popper, 1971[1945]; McElroy et al, 2006). For us, the former will consist of *descriptive* beliefs or claims about the world (the way it is), which have survived our tests and evaluations and which may help us to adapt; the latter will consist of *evaluative* or *normative* beliefs or claims about the world (the way it is or ought to be), which have survived our tests and evaluations and which may help us to adapt (McElroy, 2003; Firestone and McElroy, 2003a).

When we speak of factual knowledge, we will be talking about *truth*, although never with certainty, since we do not believe certainty of knowledge is possible in the realm of human experience, "except for valid and simple proofs in world 3" (Popper, 1979[1972]) (i.e., the world of human-created artifacts, such as logic, mathematics, etc.). In that regard, we will rely on a fallibilist theory of knowledge (Peirce, 1955[1897]; Hall, 1961; Popper, 1979[1972]; Notturno, 2001; Firestone and McElroy, 2003a; Niiniluoto, 2004[1999]).

That said, we will not deny that the world is real, or that our statements can correspond with the facts - or not - as the case may be. Here we will rely on a realist epistemology and a correspondence theory of truth (Hall, 1961; Popper, 1979[1972]; Alston, 1996; Kirkham, 2001). We will agree that a correspondence can exist between a statement and a fact, and that seeking such correspondence should be the regulative ideal of choice in knowledge production. We will simultaneously deny that knowledge with certainty of such correspondence is ever possible.

When we speak of value knowledge, we will be talking about *legitimacy* or the *fitness* or *desirability* of a fact (Hall, 1961), as opposed to the *truth* of it. Again, we will adhere to our fallibilist epistemology and will deny that knowledge of

values with certainty is possible. Still, we will claim that knowledge of values can be approached from a realist perspective, and that *legitimate* claims about values can be made just as *true* statements about facts can. Here we will rely on a blend of Hall (a correspondence theory of legitimacy, 1961) and Popper (objective knowledge, 1979[1972]).

The notion of a regulative ideal will also be vital to our epistemology, both for the truth of facts and the legitimacy of values. In the case of facts, our regulative ideal for investigating the correspondence between descriptive statements, and the facts they may correspond to, will be "the way the world is". In the case of values, the regulative ideal for investigating the correspondence between evaluative or normative statements, and the values they may correspond to, will be "the way the world ought to be". This, in turn, will lead us to another branch of epistemology that we will call *theories of evaluation* - also referred to as *justification* or *validation* by others (Hall, 1961; Kirkham, 2001). There we will find a theory known as the *Fair Critical Comparison Theory* (Firestone, 1973, 1974; Firestone and McElroy, 2003a) according to which we can test and evaluate competing fact or value claims against one another under the influence of our regulative ideals, and thereby get closer to the truth and/or the legitimate.

The epistemology we have described here is a variant of Karl Popper's Critical Rationalism (CR). We have simply expanded CR to include a component of value theory that is otherwise missing from its construction (Hall, 1952, 1956, 1961). We then apply the resulting doctrine to organizational settings (McElroy, 2003; Firestone and McElroy, 2003a, 2003b).

Mark A. Notturno, a leading Popperian scholar in the United States, characterizes CR as follows (2001):

> "Rationality, according to Popper, is not so much a property of knowledge as a task for humans. What is rational is not so much the content of a theory or a belief as the way in which we hold it. We are rational to the extent to which we are open to criticism, including self-criticism; and to the extent to which we are willing to change our beliefs when confronted with what we judge to be good criticism" (p. xxv).
> .....

> "These ideas - that objective rational knowledge is inherently fallible; and that we can never justify, but can only criticize it - are essential both to Popper's philosophy of science and to his concept of open society" (p. xxvi).

We will have more to say about Popper's ideas and their relevance to sustainability, and to sustainability measurement and reporting in particular, in Chapters 2 and 3.

1.3.2 Sustainability reports as knowledge claims

Sustainability reports, as we have constructed them, are best understood as arguments of a sort - they are arguments consisting of knowledge claims about whether or not an organization's operations are sustainable. As explained above, a report should ideally include a fact claim that expresses an organization's impact on some type of capital, and a value claim that expresses standards for what such impacts ought to be.

The fact claim should always express, in a descriptive sense, some understood or measured scope of impact that an organization claims to be having on the carrying capacity of capital. The value claim, in turn, should always express, in a normative sense, some prescriptive impact that an organization ought to be having on the same capacity, according to some norm or standard of performance.

Here we acknowledge that values are notoriously controversial. Many claim that they are entirely relativistic (i.e., one value claim is as good as another) (see Audi, for example, 2000, pp. 259-260). As we have already noted, however, we hold to a realist epistemology, not a relativist one (see Kirkham, for example, 2001, pp. 73-79). Under our epistemology, competing value claims, not just fact claims, can be judged by a correspondence theory (Hall, 1961, pp. 183-189). Thus, ours is an anti-relativist position.

1.4 RESEARCH QUESTIONS

From the preceding discussion it should be clear that the perspective we plan to take in our discussion of corporate, or organizational, sustainability is a decidedly epistemological one. Our intent, in fact, is to frame our thesis as an *epistemological theory* of *sustainability*. This orientation to the subject has also informed our thinking on what the research questions of interest to us should be. Here they are:

1. Are there any organizational sustainability measurement and reporting methods that actually (or purport to) measure and report sustainability performance in a literal (i.e., context-based) way?
   - If so, in what sense do they measure and report sustainability performance?
   - What are the key principles or assumptions behind such methods?
   - What are the key differences between the methods (with respect to scope and validity), and can it be argued that some methods are more effective than others?
   - What are the explicit or implicit epistemologies behind such methods?

The purpose of our first set of questions above is to establish the current lay of the land in terms of how organizational sustainability management takes place today - in other words, to establish the current state of the art. We then go on in our second set of questions (below) to determine whether or not any of the existing methods also happen to address social sustainability performance, in particular.

2. If these methods exist, do they measure *social* sustainability performance?
   - If so, which ones and how do they work?

Our third and final set of questions (below) then addresses the possibility that current tools and methods do not, in fact, address social sustainability performance. Of particular interest to us in that case is whether or not the principles relied upon for the measurement of non-social sustainability performance can be applied, as well, to the social domain. If so, we then want to explore the question of what the nature of such a tool or method might be.

3. If existing, literal methods do *not* address *social* sustainability performance, can the measurement principles they rely on in other domains be applied to the social domain?
   - If so, how would the resulting tool or method work, and what sort of measurement model would it entail?
   - What would its advantages and disadvantages be over other competing approaches?

1.5 METHODOLOGY

The intent of this thesis was to create a design specification, or template, for measurement models that can be used to measure the social sustainability performance of organizations. Thus, the method we followed was, at root, a design process. That said, we can distinguish between two different types of such methods: forward engineering and reverse engineering (Raja, 2008, p. 2):

> "Forward engineering is the traditional process of moving from high-level abstractions and logical designs to the physical implementation of a system."
> .....
>
> "The process of duplicating an existing part, subassembly, or product, without drawings, documentation, or a computer model is known as reverse engineering."

Forward engineering methods are typified by the following formulation (Pahl and Beitz, 2007, p. 129):

Step 1: Planning and Task Clarification,
Step 2: Conceptual Design,
Step 3: Embodiment Design,
Step 4: Detail Design.

Reverse engineering methods, however, take a different path (Raja, 2008, pp. 4-8):

Step 1: Scanning,
Step 2: Point Processing,
Step 3: Application-Specific Geometric Model Development.

Whereas in the case of forward engineering design, the purpose of the process is to solve an instrumental problem of some kind by developing (usually) a new physical artifact as a solution, in the case of reverse engineering, the purpose of the process is to duplicate, or replicate, an already-existing design for business or economic reasons. That said, it is also true that in the case of forward engineering, the analysis of existing designs often occurs as "one of the most important means of generating new or improved solution variants in a step-by-step manner" (Pahl and Beitz, 2007, p. 81).

In this thesis, we relied on a hybrid of the forward and reverse engineering design methods. Our hybrid approach, however, was dominated by the reverse engineering method, perhaps because of the degree to which we had reverse engineering in mind from the start. In general, we set out to replicate existing sustainability measurement tools of a demonstrably literal kind (i.e., ecological oriented CTA-based tools), but not in their entirety. We wanted to understand how such tools function in the ecological space, and then see if we could redesign or recast them for use in the social space, while adhering to the same robust theory of sustainability - the CTA-based approach. Thus, the replicas we set out to build were only partial replicas, with new functionality added of our own making. Given the extent to which recently-formulated reverse engineering methods give precedence and priority to the replication of existing designs, as opposed to the production of new ones, we chose to subordinate the forward design aspects of our work to the reverse engineering method, instead of the reverse.

To the extent that our hybrid approach also featured aspects of forward engineering in it, such aspects were limited to the design of new functionality as we attempted to modify the reversely-engineered models we looked at. This occurred exclusively in the form of removing ecological elements or concepts from existing methods, and replacing them with social elements of our own choosing or design.

Even here, however, our use of forward engineering logic was heavily constrained. It was constrained because we were always confined to operating within a predetermined structure and context: the reversely-engineered methods we were

trying to modify. For example, in removing natural capital elements from such models in order to replace them, the only viable substitutions we could consider were other types of capital. This was true if what we wanted was to remain true to the CTA approach, which we did. The result was the replacement of natural capital with anthro capital; there was arguably no other choice. Thus, the range of alternative designs we could consider was a very narrow one at best. Forward engineering in this case, such as there was any, was thereby reduced to modifying an existing design, as opposed to creating an entirely new one.

For that reason, the design discussion contained in Chapter 4 of this thesis does not follow the usual forward engineering pattern, in which multiple alternatives are identified, tested and evaluated against one another on a blank slate, and so forth. Instead, we confine ourselves to the modification of existing designs, since it was always our explicit intent to reverse engineer such designs (as found in the ecological space), and modify or reinvent them in some way in order to adapt them to the social space.

Despite the industrial, material focus of both forward and reverse engineering design methods, it should also be obvious that our intent was to produce an intangible artifact, not a tangible one, as is usually the case when such methods are applied. Our artifact is the Social Footprint Method, consisting of both a design specification, or template, for measurement models, and a procedure for using them.

In effect, then, much if not most of the design of the Social Footprint Method and the measurement modeling framework it entails, was pre-determined, or pre-designed, and was simply imported into the design, or adaptation, of the solution described on these pages. In that regard, many of the *functional requirements* set forth below in Section 4.3 were inspired by an understanding of how CTA-based models in the ecological domain already work, albeit with modifications made to account for the social particularities of our case. All of this came about by a concerted effort to study and abstract the central concept and theory of practice embodied in such methods, and to determine which parts of them could be applied to the social domain, and which parts would have to be replaced with new ones of our own making. That, in fact, was our first step, and it corresponds to what Raja (Ibid.) refers to as Step 1 of the reverse engineering method, *Scanning*.

Step 2 of the reverse engineering method, *Point Processing*, is a computer-based process that, in the case of physical designs, results in a raw virtual or digitized representation of material objects scanned in Step 1. As Raja explains, "The output of the point processing phase is a clean, merged, point cloud data set in the most convenient format" (Ibid., p. 7). Point clouds define, and graphically depict, the geometry of scanned objects on a computer, but only roughly so. The output of step 2, then, is a crude, digital representation of scanned material objects.

In our case, however, since we were not dealing with a material object, but instead were dealing with an intangible measurement model, our output consisted of a set of revised technical design specifications, or 'as builts' (Section 4.4), with social elements and substitutions added, and a similar modification of the underlying functional requirements (Section 4.3), again with social elements and substitutions added. On the assumption that the methods and models we set out to reverse engineer and modify were in their own case forward engineered at some point in time (i.e., their technical specifications were prospective), this part of our work essentially amounted to recalling or revisiting those earlier efforts, and revising their outcomes (i.e., *our* technical specifications are retrospective). In that regard, we were modifying earlier forwardly-engineered designs, but always against the backdrop of our own, more controlling reverse engineering method. Even so, however, we were arguably operating at Step 3 of the method, since Step 2, for us, was unnecessary for reasons we explain below.

Step 3 of the reverse engineering method, *Application-Specific Geometric Model Development*, involves the translation of digital point data (produced in Step 2) to CAD (computer aided design) models. The output of this Step is a geometric model, coded in one proprietary CAD format or another (i.e., for use with a CAD 'application'), in which the object scanned in Step 1 is fully specified. Thus, it is a linguistically-expressed technical design specification, or description, of the object. Here we can see that Steps 2 and 3 essentially work together in a joint effort to describe whatever material object has been scanned in Step 1. Step 2 provides a first approximation, and Step 3 then refines and more fully articulates it.

In our case, since we were not dealing with a material object, but instead with an immaterial one, scanning for us was a cognitive analytical process. Furthermore, because it was cognitive, our process did not necessarily require an intermediate step in which only a crude approximation of the scanned object was produced as

a precursor to the final step. Instead, we were able to move more quickly to the detailed specification, or description, of the scanned (or analyzed) object. This was further facilitated by the existence of descriptive documentation for the models of interest to us (e.g., Daly's theories, articles about the CTA approach, books and articles about the Ecological Footprint Method, etc.). This is usually not the case in most reverse engineering situations. Instead, specifications in such cases must be inferred from physical designs and then reconstructed in a presumptive fashion - with or without fidelity.

To summarize, the purpose of forward engineering is to develop new solutions; by contrast, the purpose of reverse engineering is to replicate existing ones. In our case, we relied on a reverse engineering approach to adapt an existing solution to a new problem: the need for a CTA-based model for measuring the social sustainability performance of organizations. Thus, ours was only a partial replication. Adapting an existing model for our purpose required that parts of it be re-designed for functions it was never intended to serve. To that extent, we relied on forward engineering to a degree, but only in a subordinate fashion to the reverse engineering method we had embraced.

Lastly, the options available to us as we engaged in re-design were highly constrained, both by virtue of the other aspects of the model that were not to be changed, and also by the thematic or functional nature of the elements that were to be changed, the principles of which it was important to uphold. The result is the technical design specifications (as built) provided in Section 4.4, the related functional requirements in Section 4.3, and the prototypical illustrations of the Social Footprint Method described in Chapter 5. The theoretical bases for the modifications we made to the reversely-engineered and adapted Social Footprint Method are, in turn, laid out in Chapters 2 and 3.

1.6 DISSERTATION OUTLINE

This dissertation is organized into six chapters. Chapter 1, *Introduction*, provides a general orientation to the subject of organizational sustainability, the manner in which it is tied to human well-being, and the major themes to follow in Chapters 2 through 6. Our major research questions and the methodology we followed are also included in Chapter 1.

Chapter 2, *Knowledge and Action*, presents the epistemological foundations upon which our thesis is based. There, for example, we discuss the important distinctions between knowledge of fact and knowledge of value, competing theories of truth, competing theories of evaluation, and our own commitment to fallibilism.

In Chapter 3, *Sustainability Theory and Practice*, we provide a general overview of sustainability - the social science - and the leading tools and methods used today to measure and report the sustainability performance of organizations. We conclude the chapter by returning to the epistemology discussion contained in Chapter 2, which we then rely on as we present our own epistemological theory of sustainability.

Chapter 4, *The Social Footprint Method*, is essentially an instruction manual for how to use the method in real-world situations. In particular, it describes a 5-step process for measuring and reporting the social sustainability performance of organizations; and also includes the results of a face validity survey on the method itself.

Chapter 5, *Illustrations of the Social Footprint Method*, contains the results of two prototypical applications, or illustrations, of the method. One involved a case at Ben & Jerry's Homemade, Inc., a wholly-owned subsidiary of Unilever Corporation, and the other involved a study at Wal-Mart Stores, Inc.

In Chapter 6, *Conclusion and Discussion*, we return to the research questions raised in Chapter 1, and attempt to answer them in light of the content of Chapters 2 through 5. In this chapter, we also acknowledge and respond to several issues and implications raised by the Social Footprint Method, and then conclude by identifying possible future directions for continued development and use of the Social Footprint Method.

CHAPTER 2

KNOWLEDGE AND ACTION

2.1 RELEVANCE

In Chapter 3 (Sustainability Theory and Practice), we will rely very heavily upon an epistemological approach to sustainability management, which, we will argue, gives rise to the Social Footprint Method. In order to take such an approach, however, we must first reveal the philosophical foundations of our thinking. Chief among these is the knowledge management orientation we are taking, and the ontology of knowledge and knowledge processing that lies behind it. All of that and more must be made clear. That, then, is the purpose of this chapter.

2.1.1 Action as knowledge in use

Our epistemological approach to sustainability begins with action theory (see, for example, Parsons and Shils, 1951). What we want to show are the connections between knowledge and action, and the relationships between actions, which may or may not be sustainable, and the knowledge that guides them. In a sense, we wish to start at the end and work backwards - from action to knowledge, to knowledge management, to epistemology. If one can say that there are three senses of the term knowledge (epistemological, psychological, and managerial), it will be the first and third senses that we will rely on in this thesis (the epistemological and managerial ones).

Here we take the position that while mental, or psychological, knowledge is no doubt the immediate precursor to action, our beliefs and predispositions are at least in part formed through interaction with - and acceptance or rejection of - claims made in non-mental, exosomatic form (e.g., in the form of statements contained in corporate sustainability reports). Such statements can, in turn, be objectively formed, tested, and inter-subjectively evaluated in ways unavailable to us

where mental knowledge is concerned, as a kind of quality-control test for action that we can employ *before* we act (Popper, 1979[1972], p. 244). This is the managerial (or knowledge management) sense of knowledge that we speak of here; but in order to fully understand the nature and structure of such (sustainability-related) claims, it is to epistemology that we must turn for insight and guidance.

Of central importance to our thesis, then, is the view that action is an expression or implementation of knowledge, and that knowledge, in partnership with motivation and situational circumstances, guides, informs, and animates our behaviors (Atkinson, 1964; Birch and Veroff, 1966; Atkinson and Birch, 1970). Organizational, or collective, behaviors are no different. The collective actions of cooperating individuals in organizational settings are no less expressive of individual knowledge, although collectively- or mutually-held knowledge comes into play here as well.

This view of knowledge as an informational resource that underlies the actions and behaviors of individuals and organizations is aptly referred to by Argyris and Schön as 'theories of action' (Argyris and Schön, 1996, p. 13):

> "Such organizational task knowledge may be variously represented as systems of belief that underlie action, as prototypes from which actions are derived, or as procedural prescriptions for action in the manner of a computer program. We have chosen to represent such knowledge through what we call 'theories of action', which have the advantage of including strategies of action, the values that govern the choice of strategies and the assumptions on which they are based. We define a theory of action in terms of a particular situation, S, a particular consequence, intended in that situation, C, and an action strategy, A, for obtaining consequence C in situation S. The general form of a theory of action is: If you intend to produce consequence C in situation S, then do A."

Social capital theory, for its part, offers some insights into the ontogeny of action, as well. Ostrom and Ahn (2003), for example, define social capital as "an attribute of individuals and of their relationships that enhances their ability to solve collective action problems" (Ibid., p. xiv). They later add, "...social capital is a general rubric. The fundamental theoretical question is how collective action is achieved" (Ibid., pp. xv-xvi).

In Chapter 1, we defined knowledge as *descriptive, evaluative, or normative* beliefs or claims about the world which have survived our tests and evaluations and which may help us to adapt (McElroy, 2003; Firestone and McElroy, 2003a). Here we claim that the manner in which knowledge may do so is in the nature of the role it plays as a basis for taking action. Actions taken on the basis of high-quality knowledge will therefore tend to confer an adaptive and operational advantage to an agent, whereas actions taken on the basis of low-quality knowledge will tend to have the opposite effect. This particular view of knowledge production and use as an adaptive strategy for living agents (i.e., via its influence on actual and possible actions available to living agents) is also found in the literature on complexity theory and complex adaptive systems (see, for example, Holland, 1995, Chapter 2; and Stacey, 1996, Chapter 1).

Let us now move on to relate these ideas to the context of sustainability, and in particular to the notion of actions taken by agents that may be more or less sustainable.

2.1.2 Knowledge, human activity, and sustainability

Faber et al (2005) provide a very interesting and useful framework for classifying sustainability theories. One of the variables employed in their approach addresses the question of exactly what the object of a given theory of sustainability happens to be; in other words, what the thing (or referent) is that may or may not be sustainable, according to a given theory. The authors explain as follows (Ibid., p. 7):

> "The identification of the focal artefact concerns the tangibility of the artefact to which sustainability is attributed. Concrete artefacts are labeled entities and abstract artefacts constructs."

In this thesis, the central artifact of interest to us in our own theory of sustainability is *human activity*, especially in its collective, social, and organizational form. Thus, when we speak of an organization as being sustainable or not, we will be referring to the sustainability of its activities or operations - of its *actions*, per se. And because of the fundamental role that knowledge plays in guiding and informing such action, it (knowledge), for us, is a major source of leverage in improving the quality (and sustainability) of action of all kinds.

This insight lies at the core of our epistemological theory of sustainability: the path to improvements in the sustainability of human behavior is paved with interventions aimed at improving the quality of our knowledge, and in the quality of the learning processes that produce it, as well. If what we want is improvements in the quality of actions taken in the conduct of human affairs - such improvements taking the form of enhancements in their sustainability - then it is improvements in the quality of knowledge used to take related action that we must have.

To the extent that we have chosen to interpret the sustainability issue in terms of human behavior or actions, we find that we are not alone. The leading organizational sustainability measurement and reporting system in the world, the *Global Reporting Initiative* (GRI), takes a similar view. The latest version of GRI (G3) makes its activity-based view of sustainability abundantly clear (GRI, 2006):

> "Transparency about the sustainability of organizational activities is of interest to a diverse range of stakeholders, including business, labor, non-governmental organizations, investors, accountancy, and others" (p. 4).
> .....
>
> "A stakeholder should be able to find desired information without unreasonable effort. Information should be presented in a manner that is comprehensible to stakeholders who have a reasonable understanding of the organization and its activities" (p. 18).

We will have more to say about the activity-based view of sustainability in chapter 3 where we deal more broadly with the issue of prevailing sustainability theories and practices. For now, we simply wish to make clear that we view sustainability as an analytical attribute or property of activities, and that all activities are knowledge-based (i.e., they are knowledge in use), the effectiveness (or sustainability) of which can vary with the quality of such knowledge.

2.2 KNOWLEDGE MANAGEMENT

We now bring the subject of knowledge management (KM) into our thesis because, to a large extent, the field of corporate sustainability management, or

CSM, involves deliberate and successive acts of knowledge production, the quality of which is a KM issue. When a CSM manager gathers and publishes information about the sustainability of an organization's operations, he or she is performing an act of knowledge production regarding whether or not an organization's activities have, in fact, been sustainable. Still, most of what passes today for mainstream sustainability measurement and reporting rarely includes information about the sustainability performance of organizations (Gray and Bebbington, 2005; McElroy et al, 2007). Instead, what we tend to see more often is eco-efficiency reports (Schmidheiny, 1992; WBCSD, 2000), the content of which tells us very little, if anything, about the actual sustainability performance of an organization's operations in the plain-sense meaning of the term.

Thus, a serious problem has beset the field of CSM. It is an information problem. Namely, that mainstream sustainability measurement and reporting systems, such as GRI, fail to do precisely the one thing they purport to do - which is to tell us whether or not the activities of an organization are sustainable. From this we can allege that the knowledge production processes responsible for the preparation of mainstream sustainability reports are somehow deeply flawed. And because it is knowledge processing that lies at the heart of the problem, it is to KM that we must turn for a solution.

KM, however, like epistemology, is not a unified field. There are many competing points of view about what it is and how it ought to be practiced. The particular form of KM that we rely on in this thesis is called *The New Knowledge Management* (TNKM) (McElroy, 2000, 2003; Firestone and McElroy, 2003a, 2003b, 2004, 2005), otherwise known as a variant of second-generation KM.

2.2.1 Generations of knowledge management

Knowledge management (KM) is a management discipline that seeks to enhance the quality of knowledge processing in human social systems, primarily in organizations (McElroy, 1999; Firestone and McElroy, 2003a, 2003b, 2005; McElroy 2005). It is not, however, a new discipline. Indeed, the roots of KM are at least a hundred years old and have evolved into two present-day forms: first-generation KM and second-generation KM (Ibid.).

What differentiates the two generations of KM are the particular knowledge processes they strive to have impact on. First-generation KM concerns itself only with knowledge sharing or integration processes; second-generation KM, while also concerned with knowledge sharing and integration, concerns itself with knowledge production, as well. Thus, there is an overlap of first- and second-generation KM consisting of the knowledge sharing processes they both address, but only second-generation KM also focuses on knowledge production.

2.2.2 A three-tier reference model

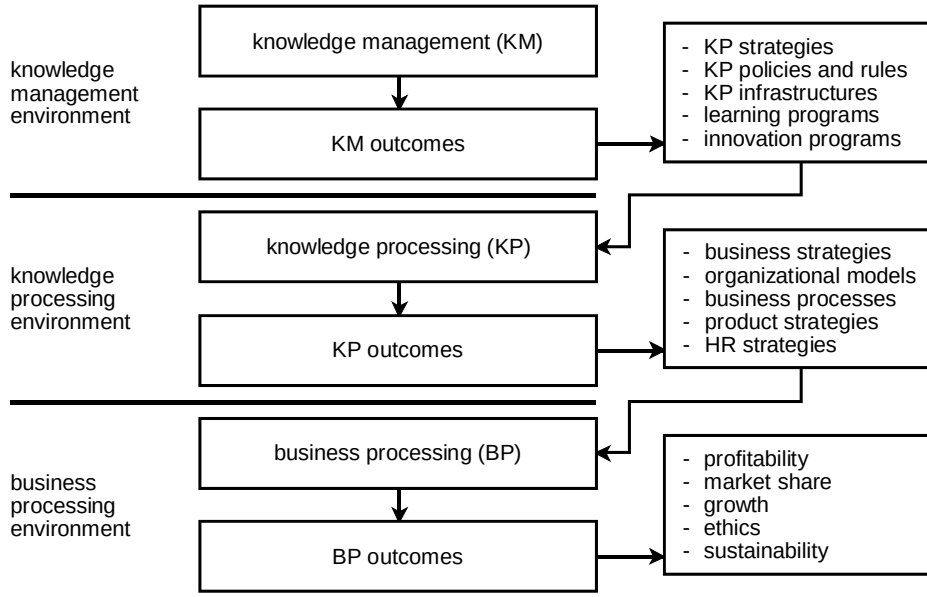
Our ability to distinguish between first- and second-generation KM is built upon another distinction that is important to stress at this time. It is the distinction between *knowledge management* (KM) and *knowledge processing* (KP). The latter consists of individual and social processes that the former seeks to enhance - much like a physician (the analog of a KM practitioner) seeks to enhance the health and anatomical functioning of a patient (the analog of a knowledge process).

Let us define these terms more carefully now, in terms of how we use them in this thesis. *Knowledge management* is a management discipline that seeks to enhance the quality of knowledge processing. *Knowledge processing*, in turn, is a personal and/or collective process by which people produce and integrate their knowledge. Thus, knowledge processing includes learning and innovation, and is largely synonymous with them. Knowledge management, in turn, is an intentional form of management in the sense that there is an object or focus of its attention; namely, knowledge processes.

Knowledge processes, of course, are not the only kinds of processes found in organizations. Most organizational processes are perhaps better described as instrumental or operational in type - they pertain to the performance or execution of an organization’s primary purpose or business, especially with regard to its commercial transactions. Here we will use the common term for such processes - *business processes* - and will distinguish them from knowledge processes, and also from knowledge management processes.

The relationships between the three kinds of processes defined above are portrayed in a reference model that we call the *three-tier model* (see Figure 2.1). Returning to our earlier discussion of the relationship between knowledge and action, we take the position that actors at all three levels of analysis take action on the basis of knowledge they have about how they should behave. Starting at the bottom of the model, we can say that people engaged in the performance of operational transactions behave in accordance with their knowledge about how to close the situational or instrumental gaps of interest to them. Such knowledge will typically include business strategies, business processes, organizational structures and functions, customer data, regulatory requirements, etc. This is the *business processing* level.

Figure 2.1 Three-tier model



Next in our model is the middle tier, the *knowledge processing* level. This level provides an account of how knowledge is produced in organizational settings - or simply *that* knowledge is produced in organizational settings - through processes that are not the same as business processes. Thus, we can make an important distinction between knowledge- or learning-related processes and the business processing functions they support. Put differently, the knowledge used as a basis for taking action in a business processing context is separately produced and inte-

grated through knowledge processes. Whereas knowledge used at the business processing level is intended to help close situational or instrumental gaps, knowledge used at the knowledge processing level is intended to help close epistemic gaps (i.e., gaps between knowledge we have and knowledge we need).

Next is the top tier of our model, the *knowledge management* level. As we have already said, the purpose of KM is to have impact on knowledge processing - to enhance the quality and performance of knowledge processes. What will vary, of course, amongst adherents to first- versus second-generation KM theories, is the scope of knowledge processes in the middle tier that practitioners of KM in the top tier are concerned with. As already noted, we ourselves subscribe to a second-generation theory, TNKM, which answers that question in its own way: KM must attend to all knowledge processes, including knowledge production.

2.2.3 The new knowledge management

Second-generation KM is a family of KM theory and practice that has more than one form or instantiation. One such form is *The New Knowledge Management*, or TNKM (Ibid.). It is, in fact, the variant we rely on in our thesis. In this section, then, we describe the salient characteristics of second-generation KM more broadly, and the specific attributes of TNKM in particular.

2.2.3.1 Second-generation KM criteria

All forms of second-generation KM, including TNKM, meet the following three criteria:

1. A sharp distinction is made between knowledge and information;
2. A sharp distinction is made between KM and knowledge processing; and a specific theory of (and model for) knowledge processing in human social systems is provided;
3. A theory of knowledge claim evaluation is provided, according to which knowledge is produced and is differentiated from information.

Unless a theory of KM satisfies all three criteria, it is not a second-generation form of KM. There are at least two well-known instantiations of second-generation KM in currency today. One is TNKM, as mentioned above. The other is a perspective put forward by Nonaka and Tekeuchi in their 1995 book, *The Knowledge-Creating Organization*, which we will henceforth refer to as the N&T model. In our thesis, we rely on the TNKM model, but will sometimes refer to the N&T model for perspective and comparisons. Each of the three second-generation KM criteria is discussed in more detail below.

2.2.3.1.1 Knowledge versus information

One fatal weakness of many first-generation KM schemes has been their failure to differentiate between knowledge and information. We will not make that mistake here, and, indeed, will rely very heavily upon a particular epistemology for making such a distinction as a cornerstone to our project. It may be helpful, then, to begin this part of our discussion by repeating the definition given to knowledge - *our* definition - in Chapter 1:

> In this thesis, we will rely heavily on the distinction between knowledge of facts and knowledge of values (Hall, 1952, 1956, 1961; Popper, 1971[1945]; McElroy et al, 2006). For us, the former will consist of *descriptive* beliefs or claims about the world (the way it is), which have survived our tests and evaluations and which may help us to adapt; the latter will consist of *evaluative or normative* beliefs or claims about the world (the way it is or ought to be), which have survived our tests and evaluations and which may help us to adapt (McElroy, 2003; Firestone and McElroy, 2003a).

It is our further contention that knowledge - beliefs and claims - are types of information. Specifically, they are a type of information that has survived our tests and evaluations, and which may help us to adapt when put into use. Such information can either be factual or evaluative/normative in content. In the case of fact-related beliefs or claims, we can say that the assertive content of such beliefs or claims can be true or false; in the case of value-related beliefs or claims, we can say that the evaluative or normative content of such beliefs or claims can be legitimate, illegitimate, or non-legitimate (Hall, 1952, 1956, 1961).

And about all of that we can say that such beliefs or claims, which have survived our tests and evaluations, may help us to adapt when put into use as a basis for taking action (Firestone and McElroy, 2005, pp. 197-198):

> "The most important aspect of information, in our view, however, is not whether it is complex or simple, or produced quickly or slowly, or gained or lost over time, or whether there is a great or a small amount of it. All of these are undoubtedly important, but the most important aspect of information is whether its influence on behavior enhances the ability of the system using it to [survive and] adapt. And this ability to [survive and] adapt, in turn, is most likely to be enhanced if the information itself actually corresponds to the reality of the system's environment [i.e., if it is true or legitimate]. Evolution provides such correspondence by selecting for those life forms that fit the environmental constraints in which they live. Errors in genetic information are eliminated over time by the environment, along with the organisms that contain them (Popper, 1987). Learning provides such correspondence on a much shorter time scale by providing us with an opportunity to eliminate our errors in information and to create new information that survives our evaluative efforts and our experience [prior to being put into use]."

We will have more to say below about our theory of knowledge, and the forms it (knowledge) can take in accordance with our definition, including the *legitimate*, *illegitimate*, and *non-legitimate* terminology we used above for values (see Section 2.3.3.1 below). For now, suffice it to say that we include at least two forms of knowledge in our thinking - *beliefs* and *claims* - and that such knowledge can be either about facts or values.

2.2.3.1.2 Knowledge processing

Unlike first-generation KM, second-generation theory does not assume the pre-existence of valuable knowledge, which only needs to be captured, organized, and delivered to people who need it. Rather, people must also *produce* their knowledge. This leads to a much more varied and sophisticated view of organizational (learning-related) activity, and ultimately to a conceptualization of what

we call knowledge processing, the wellspring of knowledge (McElroy, 1999, 2003; Firestone and McElroy, 2003a, 2003b, 2004, 2005).

All second-generation theories of KM therefore have an account of knowledge processing: what it is, and how it occurs. Most conceptions of knowledge processing take the form of cycles or 'life cycles.' We refer to such cycles as *knowledge life cycles*, or KLCs (Ibid.).

In general, a KLC is a pattern of activity that people in organizations perform, in order to produce and integrate their knowledge. It corresponds to the middle level of the three-tier model discussed above (Figure 2.1). Both N&T and TNKM incorporate explicit KLC models in their theoretical frameworks, and both thereby attempt to account for knowledge production and integration in some way.

Knowledge production is the process by which shared or sharable knowledge claims are created. It can include individual and team learning, as well as a very important process that we call *knowledge claim evaluation*, by which competing theories, or claims, are tested and evaluated (discussed more fully below).

Knowledge integration is a pattern of activity in knowledge processing that follows knowledge production. It consists of activities aimed at distributing or institutionalizing organizational knowledge into the fabric of an organization, so that it can be accessed by people who need it. In general, we can say that integrated organizational knowledge is held in the minds of individuals who have it, and also in the form of artifactual encodings, such as in files or recordings of other kinds.

2.2.3.1.3 Knowledge claim evaluation

In our discussion above on the distinction between knowledge and information, we said that "...knowledge - beliefs and claims - are types of information. Specifically, they are a type of information that has survived our tests and evaluations and which may help us to adapt when put into use." All second-generation theories of KM provide an account for how such tests and evaluations should be performed, and what the underlying theory should be. All such theories are theories of evaluation.

Here we wish to stress the distinction between mental knowledge, or beliefs, and cultural or objective knowledge, or claims. By *objective*, we mean *linguistically expressed and sharable among people*, as opposed to objective in the sense of being true with certainty (Popper, 1979[1972]). Objective knowledge, unlike mental *subjective* knowledge, can be tested and evaluated through criticism. Claims can be stated, shared, examined, passed around, and generally criticized by all who have access to them. Not so for mental knowledge. At best, beliefs can only be tested and evaluated by their individual holders, including, for example, by testing them in action.

We can therefore distinguish between beliefs and claims. It is the latter that can be subjected to interpersonal testing and evaluation, and to the special knowledge process we call knowledge claim evaluation, a subprocess in knowledge production. Knowledge claim evaluation, then, is the knowledge subprocess in organizations that is responsible for conferring the status of knowledge upon information. Claims consisting of factual and/or evaluational or normative assertions are thereby tested and evaluated in organizational processes that result in the choice or preference of some claims over others. *This is knowledge claim evaluation (KCE), and it absolutely applies to the production of knowledge about an organization's sustainability performance.*

But the manner of the specific tests and evaluations performed in KCE is unspecified by the general theory of second-generation KM. Each form or instantiation of second-generation KM, however, including TNKM and N&T, come complete with their own competing views on how knowledge claim evaluation ought to be performed. That is, they each have their own normative theory of evaluation.

The manner in which KCE is performed is mainly determined by two related theories:

1. a theory of truth, and
2. a theory of evaluation.

The former provides a regulative ideal for what should constitute truth (Ibid., especially pp. 290 and 318; Emmet, 1994, especially Chapter 7); whereas the latter provides criteria for testing and evaluating competing claims in KCE in light of such an ideal (i.e., in light of the former). As will soon become clear, we hold to the correspondence theory of truth. We believe that there can be correspondence between the assertive content of a statement and a fact in the world to

which the statement refers. Still, there is a problem with the correspondence theory (Firestone, 1973):

> "For, the facts are not 'given' to us in some pure form, but rather our knowledge of them always requires the mediation of conceptualization, of theoretical categorization. Strictly speaking, it is statements, 'observation statements', deduced from a theory, and basic statements, observation reports emerging from our experiences, which we lay side-by-side in our attempts to test and [evaluate] a theory. Statements and facts are simply not the sorts of things that admit of such a comparison" (p. 136).
> .....
>
> "A theory of truth instead expresses a regulative ideal that may tell us what we're after in discourse, but doesn't tell us how to attain it. It is like the goal of maximizing profit in business. Businessmen seek it. It may regulate their activities. But no matter how well their business is doing, they can never know if they have attained it" (p. 137).

And so when we say that we have committed to the correspondence theory of truth, and that there can be correspondence between a statement and a fact, we leave open the question of how to establish such correspondence, not to mention whether it (the correspondence) can ever be established with certainty. This issue (how to establish the correspondence between a statement and a fact, with or without certainty) is the province of separate theories of evaluation, as already noted above. Thus, a theory for how to test and evaluate competing knowledge claims, while adhering to a correspondence theory of truth, is what we mean by a theory of evaluation.

Others have referred to theories of evaluation as theories of justification (Kirkham, 2001), theories of criticism (Pell, 1930; Bartley, 1993[1987]), or theories of verification (Hall, 1961). In most cases, the purpose of such theories is to help prove or justify knowledge as true with certainty. We, however, want to be able to speak of testing and evaluating knowledge claims in more neutral terms, without having to commit to the possibility of certainty in our knowledge. For this reason as well, we refer to the process of testing and evaluating knowledge claims merely as knowledge claim evaluation, or KCE.

Let us now briefly consider the two cases of second-generation KM earlier mentioned (TNKM and N&T) in terms of the theories of evaluation they entail. Here we find that between the two, they take opposing points of view on the subject: justificationism versus fallibilism. The justificationist view holds that knowledge can be had with certainty and can be justified as such. It is arguably the dominant theory of evaluation in philosophy, business, and science today (Notturno, 2001, p. xix):

Most philosophers regard scientific knowledge as justified true belief. They regard knowledge as objective and rational to the extent to which it is justified, and they regard an argument as a justification of knowledge to the extent to which it is rational and objective."

The N&T variant of second-generation KM is the justificationist one. Indeed, N&T explicitly base their epistemology on the notion of knowledge as "justified true belief" (Nonaka and Takeuchi, 1995):

> "In our theory of organizational knowledge creation, knowledge is defined as justified true belief. Therefore, new concepts created by individuals or the team need to be justified at some point in the procedure" (p. 86).
> .....
>
> "...justification criteria need not be strictly objective and factual; they can also be judgmental and value-laden" (p. 87).
> .....
>
> "...the key justification criteria are set by top management..." (Ibid.).

In contrast to N&T's authoritarian theory of evaluation, according to which organizational knowledge is, for all intents and purposes, true with certainty by virtue of the management authority that lies behind it, TNKM takes a decidedly fallibilist and non-authoritarian point of view, with a particular emphasis on Karl Popper's epistemology. Notturno (2001) characterizes that epistemology as follows (p. xviii):

> "It [i.e., Popper's epistemology] is first and foremost an attempt to construct a non-authoritarian theory of science and society."
> .....
>
> "Popper's philosophy offers a middle way between two opposing authoritarian approaches to science and society - between irrationalist dogmatism, on the one hand, and irrationalist relativism, on the other."

We will have more to say about our embrace of fallibilism, Popperian epistemology, and the TNKM theory of evaluation we subscribe to below. For now, our goal has been to simply show that while two competing theories of second-generation KM can share a dedication to knowledge claim testing and evaluation, their approaches to doing so can be very different.

2.2.3.2 A pluralistic theory of knowledge

Since knowledge plays such a vital role in our theory of sustainability, we wish to be very clear about what we mean by the term. There are two aspects of knowledge, in particular, that are important to us. One is the kind of meaning or content that knowledge can have; the other is its form or modality.

As for meaning and content, we recognize two kinds of knowledge: knowledge of fact and knowledge of value. We will frequently make the distinction, therefore, between beliefs or claims that assert *descriptive* knowledge of the world, the way it is; and beliefs or claims that assert *evaluative* or *normative* knowledge about the world, the way it is or ought to be (Hall, 1952, 1956, 1961; Rescher, 1969; Popper, 1979[1972]; Kirkham, 2001).

The second aspect of knowledge we wish to discuss is its existential form, locus, or modality. Here we reject the monistic view of knowledge as "justified true belief", and instead adopt a pluralistic position (Popper, 1979[1972], 1994, 2000 [1982], 2002[1974]; Popper and Eccles, 2000[1977]; McElroy, 2003; Firestone, 2003; Firestone and McElroy, 2003a, 2003b, 2004, 2005; McElroy et al, 2006). We believe that in addition to mental forms, knowledge can take physical forms, such as DNA and synaptic structures, and that it can also be expressed exoso-

matically through spoken and written language. Thus, knowledge is by no means restricted to beliefs in minds.

We reject the monistic mental and justificationist view of knowledge for another reason, as well; namely as well, because of our commitment to fallibilism: the view that people can never really *justify* their knowledge as *true with certainty* (see, for example, Peirce, 1955[1897] and Popper, 2002[1935], 2000[1963]). Thus, we will argue for a fallibilist-based view of sustainability, according to which we can measure and manage the sustainability performance of organizations, without the need for certainty in our knowledge, much less consensus behind the truth or legitimacy of knowledge used as a basis for taking action.

Notwithstanding our pluralistic position, most of what we have to say concerning the epistemology of sustainability will involve what Popper referred to as world 3 knowledge, or objective knowledge. Again, Popper used the term *objective* not to refer to knowledge with certainty, but to refer, instead, to linguistically expressed knowledge that can be shared intersubjectively. In our terms, objective knowledge is roughly equivalent to *knowledge claims*, the truth or legitimacy of which can never be determined with certainty.

From this point forward, then, we will not concern ourselves with the physical form of knowledge (DNA, synaptic structures, etc.); nor with the controversy that surrounds Popper's notion of world 3 knowledge as ontologically valid. Instead, we will rely on the following four premises as a basis for going forward:

1. Linguistic assertions of knowledge and information, both descriptive and normative or evaluational, can be made;
2. The content of such assertions is objective, in the sense that it is sharable and open to criticism;
3. Such knowledge and information affect mental knowledge, or beliefs, and thereby influence action;
4. Humans are irreparably fallible in terms of the truth or legitimacy of their assertions - we can always be mistaken, and can never know anything with certainty.

As we look at sustainability measurement and reporting, then, we will take the position that such activities amount to deliberate acts of knowledge production, the results of which are descriptive and/or evaluative or normative claims, the truth of which can never be known with certainty.

2.2.3.3 Knowledge claim evaluation

As earlier noted, the most important feature of second-generation KM theories or models is the extent to which they involve knowledge claim evaluation (KCE), as explained above. Indeed, it is the presence of KCE as a subprocess in organizational knowledge processing that makes it possible to differentiate between knowledge and information (Firestone and McElroy, 2003a, Chapter 5).

We also claimed that the manner and method by which KCE is performed, or *ought* to be performed, is addressed by competing theories of evaluation (i.e., theories about how competing claims ought to be tested, evaluated, or assessed as true or possibly true, or legitimate or possibly legitimate).

Theories of evaluation, in turn, are generally put forward in conjunction with theories of truth. To define truth, for example, as coherence, still leaves open the question of how to assess or determine coherence. The same may be said of any other theory of truth, including the pragmatic and correspondence theories. With this in mind, we would now like to reveal and discuss the specific theories of truth and evaluation we rely on in this thesis, starting with the correspondence theory of truth.

2.2.3.3.1 The correspondence theory of truth

We subscribe to the correspondence theory of truth, the earliest articulation of which was perhaps given by Aristotle (Metaphysics, 1011b26):

> "To say of what is that it is not, or of what is not that it is, is false, while to say of what is that it is, or of what is not that it is not, is true."

Theories of truth can be classified into Realist versus Nonrealist theories (Kirkham, 2001, p. 73). The correspondence theory is a Realist theory. It holds that "among the conditions individually necessary and jointly sufficient for the truth of a [claim] is a condition to the effect that a certain state of affairs must obtain" (Ibid.). Kirkham defines *states of affairs* as follows (Ibid.):

"Perhaps the best way to define 'state of affairs' is to say that anything whose obtaining can be asserted (truly or falsely) with a declarative sentence [or claim] counts as a state of affairs and nothing else so counts."

According to the correspondence theory of truth, then, we can say that:

'p' is true if and only if p

where 'p' is a declarative statement of some kind and p is a state, or possible state, of affairs, or possible state of affairs, in the world. This formulation of the correspondence theory is based on Tarski (1956, 1969).

2.2.3.3.2 Karl Popper's theory of evaluation

We subscribe to Karl Popper's doctrine of Critical Rationalism (CR). CR is a fallibilist theory of evaluation that first appeared in Popper's writings in 1945 (Popper, 1971[1945]) in the context of a discussion on rationalism versus irrationalism (pp. 229-230):

> "In this issue, I am entirely on the side of rationalism [...] In my opinion, the only way in which excessive rationalism is likely to prove harmful is that it tends to undermine its own position and thus to further an irrationalist reaction. It is only this danger which induces me to examine the claims of an excessive rationalism more closely and to advocate a modest and self-critical rationalism which recognizes certain limitations. Accordingly, I shall distinguish between two rationalist positions, which I label 'critical rationalism' and 'uncritical rationalism' or 'comprehensive rationalism'."

Because of Popper's emphasis on criticism, it was necessary for him to explain how knowledge could be subjected to, and produced by means of, it, especially in light of traditional views of knowledge as something that could only be held subjectively in minds. For knowledge to be criticizable, it would have to be expressible in exosomatic form - open and sharable for all to see, poke at, test, evaluate, and accept or reject. Mental knowledge is simply not the sort of thing that admits of such inspection.

This, of course, led to Popper's identification of what he called *objective knowledge* (see, for example, Popper, 1979[1972];1994). Knowledge, according to this theory, could take an exosomatic and sharable form. Thus, not only can we criticize knowledge in such objective form, knowledge itself is produced in such ways, including mental, or endosomatic knowledge (beliefs), which is, at least in part, formed through interaction with, and contemplation of, claims expressed in the form of objective knowledge (Popper, 1979[1972]). To explain how objective knowledge is expressed and criticized in a procedural sense, Popper introduced his so-called 'tetradic schema' (Ibid., p. 119):

$$P_1 \rightarrow TT \rightarrow EE \rightarrow P_2$$

Popper explained his schema as follows (Ibid.):

> "...we start from some problem P1, proceed to a tentative solution or tentative theory TT, which may be (partly or wholly) mistaken; in any case it will be subject to error-elimination, EE, which may consist of critical discussion or experimental tests; at any rate, new problems P2 arise from our own creative activity; and these new problems are not in general intentionally created by us, they emerge autonomously from the field of new relationships which we cannot help bringing into existence with every action, however little we intend to do so."

For purposes of this thesis, we embrace Popper's Critical Rationalism as the preferred theory of evaluation underlying the sustainability position we take in Chapter 3, and the Social Footprint Method we introduce in Chapter 4. Let us now try to summarize our position in terms of what Popper's influence on *The New KM* (TNKM) school of thought has been, and in particular on the related theory of evaluation we prefer:

1. First, we regard the cyclical knowledge processing concept described above, in the case of its TNKM variant, as an organizational articulation of Popper's tetradic schema.
2. Second, we hold to a Critical Rationalist position in terms of how knowledge claim evaluation ought to be performed. Thus, knowledge claim evaluation is, for us, a process of testing and evaluating competing knowledge claims that:
    a. does not require or tolerate justificationism,
    b. is avowedly fallibilist, and

   c. is oriented towards error elimination.
3. And third, we accept Popper's notion of objective knowledge, if only in the sense that knowledge that can be expressed linguistically so that its assertive content can be comprehended, tested, evaluated, and criticized intersubjectively.

Before moving on to our discussion of the operationalized form, or implementation, of Critical Rationalism that we subscribe to - since Popper's description of 'EE' (error-elimination) was rather vague - let us conclude this section by aligning ourselves with Notturno (2001, pp. xxii-xxiii) when he says:

> "Philosophers who say that scientific knowledge *cannot* be justified are usually regarded as sceptics. But if one believes, as Popper did, that we do have scientific knowledge, that it cannot be justified, but that it is nonetheless, both objective and rational, then it follows that:
>
> 1. Scientific knowledge can no longer be regarded as justified true belief, *since no statement can be justified*;
> 2. The rationality of scientific knowledge can no longer be regarded as a product of its justification, *since no statement can be justified*;
> 3. The objectivity of scientific knowledge can no longer be regarded as a product of its justification, *since no statement can be justified*;
> 4. Scepticism - or the denial that we have knowledge - can no longer be regarded as the thesis that no statement can be justified, *since no statement can be justified;*
> 5. Justifying theories can no longer be regarded as a task for philosophy and science, *since no statement can be justified;*
> 6. Logical arguments can no longer be regarded as attempts to justify statements, *since no statement can be justified;*
> 7. The criticism that a statement or theory is not justified can no longer be regarded as a criticism, *since no statement can be justified."*

Suffice it to say that what passes as sound for scientific knowledge is, for us, equally sound for business or organizational knowledge. Let us move on, then, to our discussion of Firestone's *fair critical comparison theory*, the particular im-

plementation of Popper's Critical Rationalism theory of evaluation that we subscribe to.

2.2.3.3.3 Joseph Firestone's Fair Critical Comparison Theory (FCCT)

Above we noted that in advocating for a criticalist approach to knowledge claim evaluation, Popper's description of *EE* (error-elimination) was expressed in rather vague and open-ended terms: EE "may consist of critical discussion or experimental tests" (Popper, 1979[1972], p. 119). In order to be practicable, then, the logic of such discussion and/or the nature of such tests must be specified in a more granular fashion. Indeed, all of this highly variable (Firestone and McElroy, 2003a, p. 146):

> "Since [knowledge claim evaluation, or KCE] is just our process of testing and evaluating knowledge claims or beliefs, the practice of it will vary across individuals, groups, communities, teams, and organizations. A particular entity may use evaluation practices based on explicit rules or specified criteria to compare knowledge claims, but it need not. Agents are free to change their tests or criteria at any time, to invent new ones, or to apply ad hoc tests and criticisms in evaluation. That is, KCE is a free-for-all; it is just the process by which knowledge claims and beliefs run the gauntlet of our skepticism and our criticism."

In the case of *The New Knowledge Management* (TNKM) approach we subscribe to, we have our own preferences for how KCE ought to be performed. It is rooted in a theory of evaluation first put forward by Joseph M. Firestone in the early 'seventies, known today as the *fair critical comparison theory* (FCCT) (Firestone, 1973, 1974). In 2003, the theory was updated and cast anew in the context of TNKM (Firestone and McElroy, 2003a, Chapter 5).

As a matter of procedure, the FCCT calls for the performance of knowledge claim evaluation in two steps (Ibid., p. 159):

> "- First, fulfilling background requirements (the necessary conditions) for fair comparison among the members of a set of competing knowledge claims;

- Second, implementing comparisons among the members of this *fair comparison* set, based on a number of criteria that allow us to choose among the knowledge claims of the set based on how its members perform on various tests."

A more comprehensive discussion of the specific FCCT criteria we recommend is contained in Appendix A. Here we only wish to say that the criteria listed and described therein provide the outlines of a theory of fair comparison, and that this theory is itself a knowledge claim in need of testing and evaluation (Ibid.):

> "Furthermore, this is clearly a preliminary theory of fair comparison, so it is very unlikely that the criteria included [in Appendix A] are an adequate set either in the fair comparison requirements category, or in the knowledge claim comparison category that follow from it (the theory). The adequacy of the set of criteria certainly needs to be demonstrated as research and applications in Knowledge Claim Evaluation unfold, and the likelihood that criteria may be added to, or deleted from, the sets [...] is high.
>
> *Nevertheless, when all qualifications are said and done, this preliminary theory of fair comparison represents a new departure in knowledge management, in that it formulates a normative standard for knowledge managers to aim at in changing knowledge processing rules. No such standard has been formulated in KM until now. Indeed, KCE has hardly been addressed in the knowledge management literature at all."*

We also wish to acknowledge that by itself, there is nothing uniquely criticalist, non-justificationist, or fallibilist about the FCCT. Indeed, the same criteria could be used in support of a justificationist effort, and also in conjunction with other theories of truth that we do not subscribe to (e.g., the coherence theory, the pragmatic theory, etc.). What distinguishes the FCCT as a non-justificationist theory of evaluation in our case is the fallibilist and criticalist attitude that we bring to its use. It is the attitude and intent that makes the difference, primarily in the form of the regulative ideals we adhere to in our performance of knowledge claim evaluation.

2.3 FACTS VERSUS VALUES

In this thesis, we take the position that just as we can objectively test and evaluate our fact claims, so can we objectively test and evaluate our value claims. In the case of the former, we can seek the *truth;* in the case of the latter, we can seek the *legitimate* (Hall, 1952, 1961). Thus, not only do we reject relativism insofar as our fact knowledge is concerned, we do so as well for our value knowledge.

Accordingly, we come now to a point in our thesis where it is time to explain this idea further: that we can be just as objective and rational in the formation and choice of our value claims as we can for our fact claims (Hall, 1952, 1956, 1961; Burhoe, 1969; Walter, 1969; Firestone, 1973, 1974). To present our thinking, there are three things we must do:

1. re-state the definition and sense in which we are using the term *objective knowledge*,
2. clarify and stress the vital role that regulative ideals play in knowledge claim evaluation for *both* fact and value claims, and
3. present the value theory of Everett Hall, whose ideas form an essential part of our own epistemology.

2.3.1 An objective perspective

Previously we made the distinction between three types, or modalities, of knowledge in presenting the pluralistic theory of knowledge that we subscribe to. After Popper (Popper 1979 [1972]; 1980[1978]; 1994), we recognize:

1. knowledge held in minds, or mental knowledge (endosomatic or subjective),
2. knowledge expressed in linguistic form, such as through speech or writing (exosomatic or objective), and
3. knowledge held, or codified, in physical forms, such as in DNA or in synaptic networks.

We also declared our intent to focus mainly on the exosomatic form of knowledge, relying on such examples as *theories, statements*, and *claims* as we go forward. This is largely due to our organizational context, and the desire to con-

fine ourselves to discussions of knowledge that entail collective or intersubjective knowledge processing activities. This will prove vital to our thesis, for as we get into the subject of sustainability measurement and reporting, it will be clear - and we will stress this fact - that sustainability measurements and reports are nothing but fact/value claims consisting of knowledge expressed in linguistic, exosomatic, and objective form.

It should also be clear that in language we can make claims or assertions of both facts and values. Fact claims, for us, consist of descriptive assertions made about the world, the way it is, has been, or will be or could be. Value claims, for us, occur in two forms:

1. evaluative assertions made about the world, the way it is, has been, or will be or could be, and
2. prescriptive assertions about the world, the way it ought to have been, should be, or will be or could be.

The first type of value claim is *value predicative*, the second type is normative (Hall, 1952, 1956, 1961).

2.3.2 Regulative ideals in knowledge claim evaluation

Earlier we called attention to the vital role played by regulative ideals in knowledge claim evaluation. We made the distinction between ideals that arise from alternative theories of truth and ideals that arise from alternative theories of evaluation. Both can, and do, provide us with guidance in the search for truth, but never a criterion for it. Fallibilism denies that such a criterion can exist. Popper expressed his opinions about this in the context of Tarski's (1956, 1969) theory of truth as follows (Popper, 1994, p. 96):

> "One interesting consequence of Tarski's theory is the following - a very important one. Although there is truth, there is no *criterion* of truth. That is very important, because most philosophers mix up the idea of truth with the idea of a criterion of truth. They think that if there is an idea of truth, there has to be a criterion of truth attached to it. In other words, they are operationalists. There has to be an operation by which we find out whether or not a thing is true. Now it is quite clear

> that such an operation does not exist. If it did exist, we would all be omniscient."

For Popper, truth itself was a regulative ideal, or idea. He says:

> "...truth functions as a regulative idea for criticism" (Ibid., p. 91).
> .....
>
> "...truth plays the role of a regulative idea. We test *for truth,* by eliminating falsehood" (Popper, 1979[1972], p. 30).
> .....
>
> "My [tetradic] schema works through error-elimination, and on the scientific level through conscious criticism under the regulative idea of the search for truth" (Ibid., p. 126).

When paired with the particular (correspondence) theory of truth to which Popper and we ourselves subscribe to, the concept of a regulative ideal can be understood as follows (Ibid., p. 290):

> "This regulative ideal of finding theories which correspond to the facts is what makes the scientific tradition a realist tradition: it distinguishes between the world of our theories and the world of facts to which these theories refer."

We have also taken the position that theories of evaluation provide us with additional ideals that are just as important in regulating our search for truth as our theories of truth are, themselves. This is important. Here we can say that in the search for truth, regulative ideals are of two kinds, and function at two different levels.

The first is a *definitional* ideal; it specifies what truth consists in. In the case of the correspondence theory, truth consists in the correspondence between a claim and the facts to which a claim refers. A theory is true if it corresponds to the facts. In the case of the coherence theory, truth consists in the coherence of a claim and the descriptive content of other claims already taken to be true (Kirkham, 2001, p. 104). Thus, a theory is true if it coheres with other theories already regarded as true. In the case of the pragmatic theory, truth consists in the

agreement of everyone who investigates a theory. In particular, a theory is true if it is widely or universally agreed to as something that works well in practice (Ibid., pp. 79-87).

The second ideal is an *evaluational* one. Once again, the ideals available to us in this category depend on the particular theory of evaluation we subscribe to. We have made the general distinction between justificationist theories of evaluation, and non-justificationist theories. We hold to a variant of the non-justificationist kind: a fallibilist theory of evaluation that we call the fair critical comparison theory (Firestone, 1973, 1974), an implementation of Popper's Critical Rationalism. Others hold to justificationist theories of evaluation, which Kirkham portrays as follows (2001, p. 26):

> "It should be clear that theories of justification are not really theories of truth at all. At least it is very misleading to call them theories of truth. They are not *about* truth. They are *about* justification. They do not analyze 'truth', 'true', or 'is true' in any way. They neither state the necessary and sufficient conditions for truth nor give the meaning of 'truth'. They provide a sufficient condition (or set of jointly sufficient conditions) for our being justified in believing a proposition."

Now we, of course, do not accept the possibility of being justified in the belief or acceptance of a proposition if, by 'justified', it is meant 'true with certainty'. Instead, we have taken the position that it is more rational to reject the possibility of knowledge with certainty, and that rationality, by contrast, consists in the recognition of our fallibility and adoption of the critical attitude. Thus, we should always hold our knowledge open to criticism, never accept any claim as true with certainty, and admit that we may always be mistaken in our beliefs.

In addition to the regulative definitional ideal of correspondence that we subscribe to, we also hold to a criticalist form of an evaluational ideal (i.e., the fair critical comparison theory). That, then, is the structure of the regulative ideals we rely on in our presentation and discussion of the Social Footprint Method to follow: correspondence to the facts and fair critical comparison. Together, these ideals provide us with the epistemology and procedure required to rationally test and evaluate competing sustainability claims, be they claims of fact or claims of value.

2.3.3 The value theory of Everett Hall

Everett W. Hall was Kenan Professor of Philosophy at the University of North Carolina (UNC) when in 1960 he died, just after completing his final revision of *Our Knowledge of Fact and Value* (1961). Hall was previously known for his earlier books, including *What is Value?*, published in 1952. E. M. Adams, a colleague of Hall's at UNC who wrote the *Introduction to Our Knowledge of Fact and Value*, commented on Hall's interests, achievements, and collective works as follows (Adams in Hall, 1961, pp. x):

> "The central problems which occupied Hall were in the realms of the ontology and the epistemology of value."
> .....
>
> "All [of Hall's major works] are neatly tied together and form, I feel safe in saying, the most extensive, thorough and perceptive study ever made by one man in the field of value theory."

In this thesis, we embrace Hall's value theory as further described below.

2.3.3.1 A realist conception of values

Kirkham (2001) distinguishes between realist and nonrealist theories of truth. "A Realist theory holds that among the conditions individually necessary and jointly sufficient for the truth of a belief (proposition, sentence, or whatever) is a condition to the effect that a certain state of affairs must obtain" (p. 73). As for nonrealist theories of truth, Kirkham says: "A Nonrealist theory is any theory that is not Realist..." (Ibid., p. 78). Thus, nonrealist theories of truth include pragmatism, instrumentalism, and coherentism.

The correspondence theory of truth is a realist theory. In order for a claim to be true, the facts in the world it asserts must actually exist or obtain. It is therefore predicated on the assumption that the world is real, and that there are existents in the world.

Hall subscribed to, and relied upon, the correspondence theory of truth, as do we. But not only was Hall committed to a realist conception of truth, he was committed to a realist conception of values, or to *legitimacy,* as he would say. Thus, for Hall, our value claims make reference to things in the world that are real, have been real, or could be real. And while the objects in the world to which they refer are facts, they (our value claims) are not *descriptive* of facts as fact claims are. Rather, they are evaluations of, or prescriptions for, facts.

Hall's realism and objective approach to values is not what distinguishes him from other philosophers in epistemology. Nor is it the basis for why his ideas are so relevant to our thesis. Rather, what forms the basis of Hall's relevance to our thesis is the rigorous manner in which he attempted to apply a correspondence theory to values. Hall contended that objects of values are real, in the ontological sense of the term, and that there can, therefore, be a correspondence between value claims and the things to which they refer. He first raises this idea as follows (Hall, 1961, p. 183):

Carrying further our method of analogy [with theories of truth], can we not hope for a theory of legitimacy analogous to our correspondence theory of truth?

Here it is important to understand Hall's meaning and use of the word *legitimate.* Unlike facts, which are two-valued (i.e., a claim is either true or false), values are three-valued: a value claim can be legitimate, illegitimate, or non-legitimate, according to which individuals can express their feelings, respectively, that something is valuable, not valuable, or of no interest to them one way or the other (i.e., they are indifferent) (Ibid., p. 145).

As for the definition of values, Hall first defines facts as "that which is asserted by a true, affirmative, indicative sentence" (Ibid., p. 18). Values, however, are not descriptive, they are evaluative or normative. Thus, when confronted with competing value claims, Hall points out (Ibid., p. 144):

> "The disaccord here is not about what will be [or is] but what shall be [or ought to be]. We have thus a rivalry of claims about a fact, but not about whether it is or will be a fact. [Such competing value claims] are in some way more complex claims, claims embracing the fitness, the desirability of a (possible) fact."

After Hall, then, we can define a value claim as asserting the fitness or desirability of a fact in the real or possible world. And while we agree with Hall that emotions, like perceptual observations in the case of facts, can provide us with inputs in the formulation of our value claims, we do not agree with Hall that our value claims are based, and depend, solely upon emotions for their legitimacy (Ibid., pp. 173-174). Rather, we take a Popperian, Critical Rationalist position on the subject. Emotions certainly provide us with input of an empirical sort that we can use in forming, testing, and evaluating competing value claims. But they are no more determinative of the *legitimate* than perceptions are of the *truth.* And neither perceptions nor emotions should be taken as substitutes for reason or rationality. Reason and rationality must take account of perceptions and emotions, but should never defer to them.

If not emotions, then, what is it that our value claims can conceivably correspond to under a realist correspondence theory of legitimacy? The answer, we think, is *possible states of the world that ought to be, or the way world ought to have been in the past, or should be in the present or future.* But all of this is not just to prescribe possible states of the world, but to evaluate or assess them as well, under the influence of a regulative ideal consisting of *the world, the way it ought to be.* Value knowledge is therefore asserted in the form of objective statements or claims which assert prescriptions or evaluations of actual or possible states, which such prescriptions or evaluations are objective, and which may be legitimate, illegitimate, or non-legitimate.

Indeed, to the extent that values can be expressed and shared in objective form, they can be tested, evaluated, and criticized under our fallibilist/criticalist approach, in the same way that fact claims can. The goal in the case of values, however, is not descriptive *truth* or correctness in that sense; rather, it is evaluative or normative *legitimacy.* A value claim can be correct in the sense of being legitimate, whereas a fact claim can be correct in the sense of being *true.*

2.3.3.2 Truth, correspondence, and legitimacy

We agree with Hall when he claims that value is not a property of facts or of states of the world (Hall, 1952, Chapters 1 through 4). If it were, correct assertions of value would be descriptive in nature and would therefore be indis-

tinguishable from fact claims. Indeed, as Firestone has already pointed out (1973, p. 140):

> "[E]valuation, in the sense of an activity which asserts what is intrinsically valuable, or what intrinsically ought to be, is not an activity whose intentional import is to describe. The purport of the evaluative aspect of a theoretical network is to assert what ought to be, or what intrinsic value is attributed to something, and we can say that such networks are legitimate if they indeed correspond to what ought to be or to the intrinsic value of something."

Here it is important to resist the temptation to apply the correspondence theory (in the correlation or descriptive sense of the term) to values, as if there are value properties of some kind that inhere in facts, and which a person can correctly discover and thereby assert, or not. Worse yet would be to try to test a value claim for correspondence with an imaginary or presumed-to-be ideal or legitimate-with-certainty value of some kind, to which other value claims should be compared in order to see if their own content matches the a priori legitimate one. This would not only be metaphysically dubious, but would reduce, too, to a kind of descriptive correspondence approach, where the content of one value claim is simply being compared to the presumed or theoretical content of another. None of that is what we have in mind here.

Instead, it is important to understand that the implementation of the correspondence theory differs with regard to values than with facts in another very important way. When we test fact claims for truth, the regulative ideal we apply is (loosely) correspondence with *the way the world is.* By contrast, when we test value claims for legitimacy under the same theory, the regulative ideal we apply is (loosely) *the way the world ought to be* (past, present, or future).

Let us conclude this section by placing our regulative ideal for values under greater scrutiny. For surely not all possible ideals can be taken to be meaningful or legitimate simply because they may have a regulative effect on our thinking and behavior. We could just as easily, for example, hold all value claims to a standard of *what is best for Mark McElroy*. Under that ideal, all competing value claims would be tested for their legitimacy according to whether or not they are best for Mark McElroy.

Here, as always, we must be careful to avoid dogmatism and remain true to our criticalist epistemology. Just as we have claimed that the world exists, and that *the way the world is, was, or will be* is a meaningful and legitimate ideal to use in the case of evaluating descriptive claims, so do we make a similar claim with respect to value claims: that we can speak meaningfully of *the way the world ought to be, now or in the future, or should have been in the past.* That the world should always be for the benefit of Mark McElroy is a value claim that simply does not pass muster.

We should never forget, however, that our regulative ideals and theories of evaluation are just theories, fallible in all respects like any other theory. And so we make no special claim of certainty here, either for, and especially with respect to, our own theories. Rather, we admit the fallibility of our own thinking, and happily commend it (our thinking) to precisely the same fair critical comparison tests and evaluations we earlier recommended for use in considering any other theory. In that regard, our theory of evaluation is recursive: it can - and should - be subjected to its own standards of truth and legitimacy.

2.3.3.3 Value claim evaluation

Value claim evaluation is simply knowledge claim evaluation applied to values. We use the new term here merely to highlight the special case of knowledge claim evaluation where value claims are involved. The purpose of value claim evaluation, then, is to test and evaluate the legitimacy of competing value claims. What we want to discuss now are the important differences between fact claim evaluation and value claim evaluation. Three specific differences come to mind:

1. The change in the regulative ideal associated with the correspondence theory of legitimacy already discussed above;
2. A change in the evaluative criteria associated with the fair critical comparison theory of evaluation that we earlier presented in the context of fact claims (see Appendix A), but which we now wish to apply to value claims; and
3. The particular types and characteristics of value claims that differentiate them from fact claims, and the kinds of assertions they make that can be critiqued in knowledge claim evaluation - or value claim evaluation, as we put it.

As for the first point, we simply wish to remind ourselves that when performing knowledge claim evaluation for values, truth as a regulative ideal should be scrupulously avoided in favor of legitimacy. Legitimacy is the correspondence of a value claim with the way the world ought to be, not as it is in any sort of descriptive sense.

Next we wish to assert that the fair critical comparison theory (FCCT), previously discussed above for testing and evaluating descriptive claims, can also be applied to competing value claims. In other words, our theory of evaluation - the fair critical comparison theory (Firestone, 1973, 1974; Firestone and McElroy, 2003a) - is equally applicable to tests and evaluations of both descriptive and normative or evaluative claims. Thus, we suggest that competing value claims can be tested and evaluated for their legitimacy by subjecting related assertions to the critical standards already specified for the FCCT, including logical consistency or coherence, empirical fit, projectibility, and the many other criteria presented in Appendix A.

That said, there is one other criterion that must be added in the case of value claims: *possibility.* Here we embrace the dictum 'ought implies can', usually attributed to Kant, but more likely grounded in the ancient Roman maxim *impossibilium nulla obligatio est* (i.e., *there is no obligation to do impossible things),* as codified in 533 BC in Justinian's *Digest* (see Mommsen et al, 1985, 50.17.185). In our case, the criterion applies to value claim evaluation. In order for a value claim to be legitimate, the assertion it makes (i.e., the state of affairs or world it asserts *ought to be*) must be possible to attain. For how can one have a duty to bring about an action or state of the world that is impossible to attain?

Turning to our third and final point in this section, some attention should be given to the types, or variants, of value claims that can conceivably be made, and thereby tested in value clam evaluation. Once again, we turn to Hall for guidance (Hall, 1952, 1956, 1961). In sum, Hall posits that there are two kinds of value claims: *value predicative* claims and *normative* claims (Hall, 1952, Chapter 6). An example of the first might be 'John is good'; of the second, 'John ought to be good'. Throughout this thesis, we have been implicitly abiding by this distinction wherever we have made reference to *evaluative* value claims versus *normative* or *prescriptive* value claims.

In contemplating the two types of value claims versus the one type of fact claim (i.e., descriptive claims), Hall asks, "Are value sentences properly rendered as normatives?" (Ibid., p. 154). In other words, cannot the evaluative and normative types of value claims be combined into a single type? Hall answers as follows (Ibid., p. 177):

> "The suggestion I am about to make is, indeed, a rather natural one to make in our present situation. It is that value-predicative sentences are all elliptical; they are abbreviated or, better, incomplete normatives."

Hall then provides us with rules for converting value-predicatives into normatives (Ibid., pp. 178-179). Based on Hall, then, we take the position that all value-predicative claims reduce to normative claims, and that the normative form is the most fundamental form of value claim. Thus, the controlling regulative ideal we use in the case of testing and evaluating value claims is, properly, *the way the world ought to be.* Value-predicative claims may simply be viewed as disguised normatives, whose assertions of values amount to the making of *ought* statements about some possible state of the world. On a going forward basis, then, whenever we refer to *normative* statements alone, it should be understood that we intend to include value-predicative statements in our use of the term, as well as overtly normative statements, per se.

2.3.3.4 Legitimacy, certainty, and action

Earlier in our discussion of knowledge as a basis for action, we stressed the influence of our fallibilist epistemology in the context of factual knowledge, and declared that while knowledge with certainty is impossible to achieve, we should be no less committed to the truth as a basis for taking (what is intended and hoped to be) effective action. Now we make the same claim with respect to legitimacy. Indeed, the circumstances are exactly parallel.

And just as our descriptive knowledge of facts is fallible, so is our evaluative or normative knowledge also fallible. In the absence of certainty we must rely, therefore, on the notion of regulative ideals as a strategy for getting closer to the truth, and now also to *the legitimate.* The two respective ideals, however, are very different. One is *the way the world is,* the other is *the way the world ought*

to be. Descriptive and normative claims that survive testing and evaluation under the influence of these ideals, and in conjunction with a non-justificationist theory of evaluation, such as the FCCT, can provide us with the knowledge we need in order to take (hopefully) effective - and *sustainable* - action.

In human experience, then, there is no knowledge with certainty, nor is there any need for it in order to act. For with our critical capacity to test and evaluate claims expressed in linguistic form, we can always get closer to the truth, and now also to the legitimate.

Let us conclude this section, then, by reaffirming that action can be understood as knowledge in use, and that our knowledge generally takes two forms: *descriptive knowledge* about the way the world is and *normative knowledge* about the way the world ought to be. Both are vital to our capacity to take effective action, with values knowledge playing no less a role of importance than factual or descriptive knowledge does. Both consist of assertions that are never correct with certainty, but which have simply survived our tests and evaluations as a precursor to action.

2.4 SUMMARY

Of vital importance to our thesis is our contention that sustainability measurement and reporting is fundamentally an act of knowledge production, and that sustainability managers, therefore, can (at least indirectly) have impact on the sustainability performance of organizations by enhancing their capacity to produce related claims. Armed with more accurate information about actual sustainability performance, managers responsible for improving and maintaining such performance can take more effective action. By taking this position, we have intentionally sought to reveal corporate sustainability management (CSM) as the epistemological undertaking that it is, while raising at the same time questions about which particular theories of knowledge, truth, and so forth ought to be applied.

The purpose of Chapter 2, therefore, has been to plumb the depths of epistemology insofar as it relates to the making of sustainability knowledge claims. In so doing, our intent has been to set the stage for the use of the same ideas in Chapters 3 and 4, in particular, where we will:

1. examine the current lay of the land in the science and literature of sustainability (including by means of our epistemological lens), and
2. put forward our own proposals for how best to measure and report the sustainability performance - the *social* sustainability performance, in particular - of organizations.

What we will see as we move ahead is that it is precisely the epistemological perspective that opens the door to insights about how best to measure and report the social sustainability performance of organizations, in a way that would have hardly been possible without it.

Let us then try to summarize the essence of the epistemological perspective we have presented here. What we have argued for above is a view of action - and its sustainability aspects and consequences, in particular - as knowledge in use. Here, the relevance of action to our thesis is further reinforced by the fact that it is precisely action - *organizational* action - that is the referent of corporate sustainability measurement and reporting. We then suggested that the quality (and sustainability) of organizational action can, in turn, be enhanced by improving the quality of knowledge processing in organizations. Indeed, the science of doing so is called *knowledge management* (KM).

KM, however, is not a unified field - there are at least two schools of thought to contend with. For our part, we hold to a school known as The New KM (TNKM). Central to the that school is its grounding in Karl Popper's Critical Rationalism, a *fallibilist* epistemology for testing and evaluating competing knowledge claims. Justificationism, or the view that there can be knowledge with certainty, should, on the other hand, be roundly rejected. Instead, we argue, knowledge is merely information that has survived our tests and evaluations, and which may always be false - such is our fallibility. And all of this, we think, applies to our knowledge of norms and values, not just to facts.

It should also be clear that Chapter 2 has spoken directly to one of our key research questions, which was to reveal the explicit and/or implicit epistemologies behind leading sustainability theories and practices. As we examine this issue more directly in Chapter 3, we will rely heavily on concepts and terms introduced and explained in this chapter as a framework for doing so.

Armed with the epistemological background summarized above, then, we are now ready to use it in our analysis of contemporary and historical sustainability theory and practice, and ultimately as a conceptual basis, or philosophy, for developing our own solutions and methodology. This, coupled with the sustainability principles to be covered in Chapter 3, will provide us with the full, theoretical framework required to develop and introduce the Social Footprint Method in Chapter 4.

CHAPTER 3

SUSTAINABILITY THEORY AND PRACTICE

3.1 INTRODUCTION

Having laid the epistemological foundations for our thesis in Chapter 2, we now turn our attention to the subject of sustainability theory and practice, per se. This, in turn, will complete the background required to introduce and understand the Social Footprint Method presented in Chapter 4. Our goals for this chapter, then, are as follows:

1. To identify some of the leading historical and contemporary theories and practices of sustainability, and to discuss their strengths and weaknesses from our perspective;
2. To highlight a particular theory of sustainability that we have embraced as the basis for our own approach - *the capital theory approach;*
3. To introduce and explain our own concept of *sustainability quotients;*
4. To highlight and explain the epistemological nature of sustainability measurement and reporting, using concepts that we introduced in Chapter 2, and which we will continue to rely on in Chapter 4.

3.2 ANALYTICAL FACTORS

The field of sustainability is anything but stable in terms of its own conceptual foundations. Indeed, virtually any two books or papers on *sustainability* are liable to be using the term differently, thereby raising the most basic questions about what people really mean when they talk about it; or better yet, what they ought to mean. This, in turn, has engendered a broad range of competing and inconsistent practices at the global, national, and organizational levels of analysis, insofar as the management of sustainability policies, programs, and practices is

concerned. What for one school of thought is sustainability management is very often, for another, nothing of the kind.

Under the circumstances, then, we can hardly hope to proceed with our plan to introduce a new sustainability measurement and reporting method, without acknowledging, if not resolving, the current state of affairs in the field. To do this, we will need to go over some old ground (some history in the evolution of thought about sustainability), especially as it applies to organizations, our primary focus of interest. Still, we will not delve too deeply into the past, but will only plumb the depths of history to the extent required to put our own thinking in context.

In order to proceed, we will need to have some basic analytical terms defined ahead of time, so that we can compare and contrast one theory, or school of thought, against another. The fact is that very few commonly-held principles and definitions in the field of sustainability exist, and so it may be more useful, as we compare and contrast competing theories against one another, to refer to general attributes, or analytical aspects, of theories as a means of telling them apart. Here we find that only a few variables are needed, for the differences between leading sustainability theories and practices are that great. That said, we will rely on three primary factors in our review of sustainability theories and practices:

1. Social versus ecological focus;
2. Referents of sustainability;
3. Sustainability context.

3.2.1 Social versus ecological focus

The first major differentiator between one sustainability theory or practice and another is whether or not they are cast in ecological terms, social terms, or both. While many, if not most, discussions of sustainability deal extensively with human impacts on the environment, the subject is certainly not limited to that. Our own particular interest, for example, is with the social domain, not the ecological one. Still, the measurement and reporting method we will propose in Chapter 4, the Social Footprint Method, was largely inspired by comparable methods that originated on the ecological side of the subject.

3.2.2 Referents of sustainability

Another top-level differentiator in distinguishing between one sustainability theory or practice and another is *that to which the attribute of being sustainable, or not, is, or can be, ascribed.* Faber et al (2005, p. 7) make a useful distinction here between concrete artifacts, which they call *entities,* and abstract artifacts, which they call *constructs,* the latter consisting of unobservable properties or attributes of objects. As we look at competing theories and practices of sustainability, then, we will attempt to identify the basic referents of interest for each of them.

3.2.3 Sustainability context

In Chapter 1, we called attention to the importance of what the Global Reporting Initiative (GRI) refers to as *sustainability context* in the preparation of corporate CSM reports. GRI defines this term as follows (GRI, 2006, p. 13):

> "***Sustainability context***
>
> *Definition:* The report should present the organization's performance in the wider context of sustainability.
>
> *Explanation:* Information on performance 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.

> This concept is often most clearly articulated in the environmental arena in terms of global limits on resource use and pollution levels. However, it can also be relevant with respect to social and economic objectives such as national or international socio-economic and sustainable development goals. For example, an organization could report on employee wages and social benefit levels in relation to nation-wide minimum and median income levels and the capacity of social safety nets to absorb those in poverty or those living close to the poverty line. Organizations operating in a diverse range of locations, sizes, and sectors will need to consider how to best frame their overall organizational performance in the broader context of sustainability. This may require distinguishing between topics or factors that drive global impacts (such as climate change) and those that have more regional or local impacts (such as community development). Similarly, distinctions might need to be made between trends or patterns of impacts across the range of operations versus contextualizing performance location by location."

In our discussion of sustainability theories and practices below, we will address the question of whether or not a given theory or practice includes consideration of sustainability context in its outlook. Here we will distinguish between concepts that do or do not by referring to them as instances of *hard* versus *soft sustainability*, respectively. A hard sustainability theory or practice will be regarded as such because of the extent to which it literally measures social impacts against existing social conditions in the world, whereas a soft theory or practice will not be so regarded because of its failure to do so.

3.3 SOME LEADING THEORIES AND PRACTICES

Let us now jump into the fray, so to speak, by identifying and discussing some leading sustainability theories and practices. Of particular interest to us will be theories and practices related to *sustainability accounting*, or concepts and methods by which the sustainability of human social systems can be measured and reported. Here we will also make the theory versus practice distinction as we go, while at the same time providing our own critique of what we find using the analytical factors set forth above.

3.3.1 Early pioneers

Perhaps the earliest known theory of sustainability, as such, was put forward by Hans Carl von Carlowitz, who in 1713 published the first comprehensive treatise on forestry, including instructions for how to achieve sustainable yields. Later that same century, Thomas Robert Malthus (1998[1798]), put forward his well-known 'iron law of population', according to which he claimed that "the tendency of population towards geometric growth would always outstrip the growth in food supply" (Dresner, 2006, p. 11). Both of these theories can be classified as ecological theories of sustainability, the referents of which are human behaviors of one kind or another. Since both also took sustainability context explicitly into account (i.e., the available supply of mature trees or food, respectively), von Carlowitz's and Malthus's theories can be classified as *hard* sustainability theories. Had they merely been arguing for reductions in consumption levels without tying such levels to available supplies, they would have been preaching soft sustainability theories, or doctrines of eco-efficiency (Schmidheiny, 1992, p. 10; WBCSD, 2000).

Next in our account comes John Stuart Mill, who in 1848 published his *Principles of Political Economy* (Mill, 1848). In that work, he introduced the idea of a 'stationary state economy', "one which in today's language was not growing" (Dresner, 2006, p. 18). Mill explained his thinking as follows (Mill, 1848, p. 308):

> "I cannot, therefore, regard the stationary state of capital and wealth the unaffected aversion so generally manifested towards it by political economists of the old school. I am inclined to believe that it would be, on the whole, a very considerable improvement on our present condition. I confess I am not charmed with the ideal of life held out by those who think that the normal state of human beings is that of struggling to get on; that the trampling, crushing, elbowing, and treading on each other's heel, which form the existing type of social life, are the most desirable lot of human kind, or anything but the disagreeable symptoms of one of the phases of industrial progress..."

Daly (1996) interprets Mill's stationary state as "a condition of zero growth in population and physical capital stock, but with continued improvement in technology and ethics" (p. 3). Mill adds (1848, p. 311):

> "If the earth must lose that great portion of its pleasantness which it owes to things that the unlimited increase of wealth and population would extirpate from it, for the mere purpose of enabling it to support a larger, but not a better or happier population, I sincerely hope, for the sake of posterity, that they will be content to be stationary, long before necessity compels them to it."

Like Malthus, Mill was concerned with ecological constraints and the satisfaction of human needs within them. His sustainability theory is therefore of an ecological kind, with human economic behavior as its referent. And to the extent that his 'stationary state' concept took ecological constraints explicitly into account, Mill's theory, like Malthus's, fits into our category of *hard* sustainability.

From Mill, we jump into the twentieth century where we find the advent of ecological economics and its seminal thinkers, and what may be the earliest expression of sustainability principles in more modern times: the concept of a 'sustainable society' as put forward at an ecumenical study conference on *Science and Technology for Human Development* held by the World Council of Churches in 1984. There the concept was defined as follows (World Council of Churches, 1994[1984]):

> "First, social sustainability cannot be obtained without an equitable distribution of what is in scarce supply or without common opportunity to participate in social decisions. Second, a robust global society will not be sustainable unless the need for food is at any time well below the global capacity to supply it and unless the emission of pollutants are well below the capacity of the ecosystems to absorb them. Third, the new social organization will be sustainable as long as the use of non-renewable resources does not out-run the increase in resources made available through technological innovation. Finally, a sustainable society requires a level of human activities which is not adversely influenced by the never-ending large and frequent variations in global climate."

This remarkable, and relatively unknown, manifesto arguably preceded and upstaged every leading sustainability theory and practice from the late twentieth century to modern times. Not only is it ecological in focus, it is socially oriented as well. In effect, then, it preceded both Elkington's (1998) notion of multiple bottom lines (i.e., the 'triple bottom line') and the Ecological Footprint (Rees,

1992; Wackernagel and Rees, 1996) by at least eight years, and Daly's (1990) articulation of sustainability principles by almost as much. It even preceded the venerable Brundtland Report's (WCED, 1987) definition of sustainable development, and its inclusion of social considerations in its general formulation of sustainability, by three years. All of these frameworks, still current today (including our own), are arguably rooted in this little known doctrine, the content of which provided a thoughtful glimpse of how to operationalize sustainability accounting, from theory to practice, with human activity as its referent, and context taken fully into account.

Finally, we wish to briefly acknowledge one more important contribution to the field of sustainability; namely, the work of the Club of Rome, which in 1972 published the ground-breaking book, *The Limits to Growth* (Meadows et al, 1972). In their case, the methodology they used involved system dynamics modeling (Forrester, 1961, 1969, 1971) and the development of a model of human activity called the *World* model, in which sustainability context was firmly ensconced. This context took the form of many premises and assumptions about ecological constraints in the world, prevailing social conditions, consumption patterns, population growth, etc. that the authors relied on. The model, in turn, was used to determine whether or not various possible futures of human activity on Earth would be viable within assumed (predicted) social and ecological constraints. By our definition, what they did was to measure and report, albeit on a prospective and exploratory basis, the *sustainability performance of the global human population* with sustainability context taken fully into account.

Donella Meadows would later go on to extend her approach to the field of retrospective measurement and reporting (i.e., into *our* field), taking inspiration, as we have ourselves, from Herman Daly's work (Daly, 1973, 1977, 1990, 1996; Meadows, 1998). Thus, in many respects, we view our own work in this thesis as one attempt to pick up where Meadows and her Balaton Group collaborators left off in 1998, recognizing that both efforts are rooted in the important influence of Herman Daly in the field, and the urgent need to both extend (beyond ecological contexts) and operationalize (for management purposes) his ideas at the organizational level of analysis.

Table 3.1 Some sustainability theories and their attributes

	focus	referent	includes context (y/n)
Von Carlowitz	ecological	human activity	yes
Malthus	ecological	human activity	yes
J.S. Mill	ecological	human activity	yes
Meadows et al (Club of Rome)	ecological and social	human activity	yes
World Council of Churches	ecological and social	human activity	yes

In Table 3.1, we attempt to summarize the theories discussed above. Of particular note is the fact that all five treatments of sustainability explicitly included context in their thinking, and also regarded human activity as the primary referent of interest. And while all five also addressed ecological concerns, only the Meadows et al (1972) and World Council of Churches (1994[1984]) theories incorporated social concerns, as well. That said, neither of them (nor any of the others) were explicitly aimed at the organizational level of analysis, and only the Meadows et al team contemplated a measurement model, or tool, of some kind. Still missing, then, was, and is, a tool or method for measuring the social sustainability performance of an organization, with context fully included.

3.3.2 The Ecological Footprint Method

Following advances made in the theory of sustainability, mainly on the ecological front, a methodology soon emerged by which the ecological sustainability of a human collective could be measured and reported with context taken fully into account. Known as the Ecological Footprint Method (EFM) (Rees, 1992; Wackernagel and Rees, 1996), the method is explained as follows (Wackernagel and Rees, 1996, p. 9):

> "Ecological footprint analysis is an accounting tool that enables us to estimate the resource consumption and waste assimilation requirements of a defined human population or economy in terms of a corresponding productive land area."

What the EFM makes it possible to do, then, is estimate the impacts of human activity on the Earth's ecology, and then compare such impacts to the Earth's capacity to withstand them, without crossing or exceeding related physical limits. This, in turn, rests on another concept long established in ecology - *carrying capacity*. We will have more to say about carrying capacity later on in this chapter, but for now, suffice it to say that the term refers to the ecological capacity of the planet to support the natural resource consumption and waste emission patterns of human (and non-human) behavior. A given population can either live within that capacity, or it can exceed it. If it exceeds it, it means that its impacts are eroding, if not permanently destroying, some portion of the Earth's capacity to support human (and non-human) life. For example, when we consume oil, for all intents and purposes, we consume it forever. And when we consume water at rates that exceed the regenerative capacity of aquifers, we undermine their capacity to provide water at all.

Of central importance to the EFM, therefore, was (and is) its embrace of *sustainability context* as we have defined it. The particular context of interest here is the Earth's ecology, and the physical constraints it imposes on humankind (and other forms of life) in terms of how much we can expand the scope of our activities (i.e., consumption), and the size of our population, without exceeding such constraints. As noted above, we know of only one other methodology, per se (i.e., not including Malthus's so-called 'iron law'), in existence prior to the appearance of the EF, which took sustainability context fully into account when assessing the sustainability of human behavior; namely, the *World* model developed by the Club of Rome Project and published in 1972 (Meadows et al, 1972). In some respects, the EFM is a descendant of the approach taken in that report - it is a descendant in the sense that it sets out to compare human impacts on Earth with the Earth's capacity to withstand them. But whereas the Club of Rome team utilized a system dynamics approach (Forrester, 1961, 1969, 1971) to perform their analysis, the EFM relies on a much simpler model involving the use of energy and materials flow analysis. Another difference is that the *World* model was designed to prospectively measure and report both the social and ecological impacts of hu-

man activity; the EFM, by contrast, is retrospective in scope and deals only with ecological impacts.

Three specific features of the EFM make it especially relevant to our thesis. The first is its explicit inclusion of sustainability context, which in the EFM's case is available *bioproductive land* - all ecological impacts are measured against constraints imposed by the fact that such land is limited. The second is its reference to *human activity* as that to which sustainability can be ascribed, or not (i.e., its *referent* is human activity). And third is its orientation towards the reporting of sustainability on a per capita basis. Later on we will stress the importance of these same ideas as we present and describe our own conception of the analogous *Social* Footprint Method.

3.3.3 The organizational context

Now we wish to turn decidedly in the direction of corporate or organizational sustainability. Thus, in this section we will not be talking about sustainability in a macroeconomic context, but instead will be looking at mainstream theories and practices at the microeconomic, or organizational, level of analysis, our primary focus of interest. Here we intend to provide a brief, and inevitably incomplete, look at leading schools of thought, tools, methods, etc. that have emerged in the corporate context. First we will catalogue some current definitions of sustainability taken from the business literature, and then we will look at corresponding tools and methods for measuring and reporting corporate sustainability performance. All of that, then, will set the stage for the introduction of our own ideas about how sustainability ought to be approached.

3.3.3.1 Competing definitions

Let us begin by examining some leading definitions of sustainability taken from the business literature on the subject. Included are definitions expressed in terms general enough to be applicable to businesses and organizations, and not just social systems of larger sizes. Here, then, in chronological order, is at least a partial

summary of the leading sustainability theories and definitions in business that we know of:

> "For the business enterprise, sustainable development means adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today while protecting, sustaining and enhancing the human and natural resources that will be needed in the future" (International Institute for Sustainable Development [IISD] et al, 1992, p. 1).
>
> .....
>
> "Sustainability is an economic state where the demands placed upon the environment by people and commerce can be met without reducing the capacity of the environment to provide for future generations" (Hawken, 1993, p. 139).
>
> .....
>
> "...sustainability is a *simple* concept: it means living in material comfort and peacefully with each other within the means of nature" (Wackernagel and Rees, 1996, p. 32).
>
> .....
>
> "Sustainability is the capability of an organization (or society) to continue its activities indefinitely, having taken due account of its impact on economic, social and environmental capitals" (Association of Chartered Certified Accountants, [ACCA] 1997).
>
> .....
>
> "...the sustainability agenda, long understood as an attempt to harmonize the traditional financial bottom line with emerging thinking about the environmental bottom line, turned out to be more complicated than some early business enthusiasts had imagined. Today we think in terms of a 'triple bottom line,' focusing on economic prosperity, environmental quality, and - the element which business had preferred to overlook - social justice" (Elkington, 1998, p. 70).
>
> .....

> "Sustainability may best be defined as the *capacity for continuance into the long-term future*... By contrast, sustainable development is the process by which we move towards sustainability... It [achieving sustainable development] is a social and economic project as much as an environmental project, with the very positive objective of optimizing human wellbeing" (Porritt, 2005, pp. 21-22).
>
> .....
>
> "Sustainable development is a dynamic process which enables all people to realize their potential and to improve their quality of life in ways which simultaneously protect and enhance the Earth's life-support systems" (Forum for the Future, as quoted by Jonathan Porritt, Founder/ Director, in Porritt, 2005, p. 22).
>
> .....
>
> "[Sustainability is] the balance between [anything to which the property of *sustainable* or *unsustainable* can be ascribed] and its social and natural environment. Therefore, [a thing] is sustainable if its internal structure is in a dynamic balance with its social and natural environment" (Jorna, 2006, p. 10).
>
> .....
>
> "A sustainable corporation is one that creates profit for its shareholders while protecting the environment and improving the lives of those with whom it interacts... Sustainability in practice can be seen *as the art of doing business in an interdependent world*... Sustainability means operating a business in a way that causes minimal harm to living creatures and that does not deplete but rather restores and enriches the environment" (Savitz, 2006, p. x).

The World Business Council for Sustainable Development (WBCSD) has evolved a two-part definition of sustainability over the years (Blackburn, 2007, pp. 18-19). The first is *eco-efficiency* and the second is *corporate social responsibility*. They define these terms as follows:

> "Industry is moving toward 'demanufacturing' and 'remanufacturing' - that is, recycling the materials in their products and thus limiting the use of raw materials and of energy to convert those raw materials [...]

> That this is technically feasible is encouraging; that it can be done profitably is more encouraging. It is the more competitive and successful companies that are at the forefront of what we call 'eco-efficiency' " (Schmidheiny, 1992, p. 10).
> .....
>
> "Corporate social responsibility is the continuing commitment by business to behave ethically and contribute to economic development while improving the quality of life of the workforce and their families as well as of the local community and society at large" (WBCSD, 1999, p. 3).

So let us now briefly comment upon the various sustainability theories and definitions quoted above, using our three-part analytical framework to do so. First, the vast majority (eight out of ten) of the positions quoted above see sustainability as involving both social and environmental factors. This is consistent, we think, with the influence that one of the definitions (Elkington's) has had on business in general, and the extent to which his *triple bottom line* metaphor has spread throughout industry, along with the mantra it has produced: *people, planet, profit.*

Insofar as prevailing referents are concerned, things are almost as consistent. The vast majority of theories and definitions seem to revolve around organizational *behaviors* or *activities* as the central referent of interest. In the quotations above, such referents show up variously in the form of 'living', 'activities', 'doing business', 'operating a business', and 'behav[ing]'. From where we sit, they are all making reference to the same basic thing: *human behavior, action, or activities* - if even only obliquely so in some cases. Here we wish to note that this interpretation of what the primary referent is in corporate sustainability management is more or less confirmed as a matter of generally accepted standards, as evidenced in the leading international standard for corporate sustainability reporting: the Global Reporting Initiative (GRI). Indeed, GRI declares as much as follows (GRI, 2006, p. 4):

> "Transparency about the sustainability of organizational ***activities*** is of interest to a diverse range of stakeholders, including business, labor, non-governmental organizations, investors, accountancy, and others" (emphasis added).

Let us also acknowledge the non-activity based views of sustainability referred to above, some of which are rather vague in our view. One, the IISD et al definition, included 'business strategies' as a referent. Another, the Porritt definition, seemingly makes reference to a 'capacity' as a referent. And a third, the Hawken view, refers to an 'economic state'. Interestingly, Jorna takes a more guarded approach. For him, the referent of sustainability could be any number of things. In that sense, Jorna's definition is more of a *design specification* for a sustainability theory or definition than a particular instantiation of one itself. It stands alone in that regard.

Our third and last differentiator of sustainability theories, definitions, and practices is the *sustainability context* dimension. Here things are surprisingly consistent and unified, although for some theorists the context is an exclusively ecological one, whereas for others it is social, environmental, and/or economic. Still, if we can agree to regard any reference to the background state of social, environmental, or economic conditions in the world as an invocation of context, then we think we can say that virtually all of the positions quoted above are grounded in sustainability context (of some kind). The reason we say things are so surprisingly consistent is that virtually none of them actually apply this concept in practice when it comes to measuring and reporting the sustainability performance of organizations. Of course, not all of them are *practices*, per se. Nonetheless, only the Ecological Footprint Method (Rees, 1992; Wackernagel and Rees, 1996) explicitly applies the concept of sustainability context in their methodology, as we, of course, purport to do in our own Social Footprint Method. We comment further on this later on.

Before moving on to consider some more explicit tools and techniques designed for measuring corporate sustainability, we should pause here for a moment to observe that many theories and definitions of sustainability tend to conflate, and thereby confuse, the terms *sustainability* and *sustainable.* These terms require separate definitions, if only for the reason that one is a noun (sustainability) and the other is an adjective (sustainable). For purposes of this thesis, then, our definitions are as follows:

Sustainability: The subject of a social science that studies human impacts on various kinds of capital (natural, human, social, and construct-

ed), relative to norms for what such impacts ought to be in order to ensure human well-being;

Sustainable: An adjective used to indicate a state of affairs in which human impacts on various kinds of capital (natural, human, social, and constructed) conform to norms for what such impacts ought to be in order to ensure human well-being.

We will come back to these ideas again before concluding this chapter, particularly in connection with our discussion of the capital theory approach (CTA) to sustainability discussed below.

3.3.3.2 The Global Reporting Initiative (GRI)

By far and away the leading methodology - and dominant international standard - for measuring and reporting corporate, or organizational, sustainability is the Global Reporting Initiative (GRI). The GRI standard was originally conceived in 1997 in the United States by the Boston-based Coalition for Environmentally Responsible Economies (CERES) and Tellus Institute, with the support of the United Nations Environment Programme (UNEP). The second version was released at the World Summit for Sustainable Development in Johannesberg in 2002. Later that year, GRI became a separate institution with its own identify, with its Secretariat located in Amsterdam. In October, 2006, the third version of the standard ('G3') (GRI, 2006) was released. Although the GRI is independent, it maintains an affiliation with UNEP and works in cooperation with the United Nations Global Compact. As of mid-2007, approximately 1300 companies around the world had committed to preparing GRI reports for 2006.

GRI describes itself and its mission as follows (GRI, 2007, home page on website at www.globalreporting.org):

> ***"A common framework for sustainability reporting***
>
> The Global Reporting Initiative's (GRI) vision is that reporting on economic, environmental, and social performance by all organizations becomes as routine and comparable as financial reporting. GRI accom-

> plishes this vision by developing, continually improving, and building capacity around the use of its Sustainability Reporting Framework."

The GRI method relies on a standardized set of indicators for measuring and reporting organizational sustainability. In general, it is organized around the triple bottom line concept (Elkington, 1998). Thus, its indicators are grouped into three sections:

1. economic performance,
2. environmental performance, and
3. social performance.

Of particular interest to us is how GRI fares relative to our three-part analytical framework for sustainability theories and practices. First, GRI has both a social and ecological orientation, and also an economic one, which is arguably just a subset of the social dimension. Next, its referent consists of organizational activities, as already noted above. And third, it is one of the leading voices insofar as the importance of sustainability context in reporting is concerned. Nonetheless, while it is true that GRI argues for the inclusion of such context in sustainability reporting, its own guidelines fail to require it, and completely lack any guidelines or procedures for how to do so.

Thus, GRI is a measurement system that lacks sustainability context in practice, and which, because of it, is technically not a sustainability measurement and reporting system at all. While it may be dedicated to triple bottom line reporting, what it actually delivers is *triple top line* reporting, at best. This is because without context, there can be no assessment of performance, only tracking of trends and relative movements. As Gray and Bebbington put it (2005, p. 7):

> "Within those reports identified as 'sustainability reports' [...] even those that are 'in conformance with' the Global Reporting Initiative Sustainability Reporting Guideline provide only the most superficial data on the extent of the organisation's sustainability or otherwise. Indeed, sustainability is much more likely to be entirely ignored; it is rare to see any corporation address it at all. No reasonable person could make any sensible judgement on the basis of an organisation's reporting in their 'Sustainability Reports' on whether or not the organisation was [sustainable or] unsustainable."

To us, this amounts to nothing short of a crisis in CSM. It is a crisis because as long as mainstream sustainability measurement and reporting tools are being used *as if* they are addressing sustainability - when, in fact, they are not - the possibility will exist that the actual sustainability performance of organizations will never be known, even as their impacts in the world potentially worsen (i.e., in the form of increasing social and environmental harms).

3.4 THE CAPITAL THEORY APPROACH (CTA)

Now we wish to turn our attention more carefully to the basis and meaning of claims about whether or not a thing is sustainable. First we must reaffirm our commitment to human activity, or to *action,* as the main thing, or referent, of interest to us. When we say that a company is sustainable or unsustainable, what we really mean is that their *activities* as performed by their employees or agents are sustainable or unsustainable. This, in turn, will later earn us the right to attribute such activities (and related responsibilities) to the humans involved in organizations and collectives, since, strictly speaking, corporations and social systems are abstractions, incapable of taking action as such. Instead, it is people who take action in their organizational and social identities; and it is people, therefore, whose actions ought to be considered when assessing the sustainability of organizational behavior.

Earlier we offered our own definition of sustainability, as follows:

Sustainability: The subject of a social science that studies human impacts on various kinds of capital (natural, human, social, and constructed), relative to norms for what such impacts ought to be in order to ensure human well-being.

Here we wish to stress the connections between action and capital, and in particular the impacts that human activity can have on vital capitals. Understanding these impacts, in turn, can form the basis for drawing conclusions about the sustainability of the actions involved. By *vital,* we mean to refer to capitals that humans depend on, and which they use or consume in the service and support of their well-being. We will elaborate on this idea below, but let us now simply declare that this way of looking at sustainability is the way we have chosen in the

development of our thesis. It also comprises a theoretical foundation, or school of thought, for sustainability that has a long tradition. Some refer to it as the *capital theory approach* to sustainability, or CTA (Stern, 1997).

There are explicit signs of CTA in at least one of the competing definitions given above, the ACCA definition. Here it is again (Association of Chartered Certified Accountants, 1997):

> "Sustainability is the capability of an organization (or society) to continue its activities indefinitely, having taken due account of its impact on economic, social and environmental capitals."

Each of the remaining definitions can also be interpreted through the CTA lens. Starting with the IISD definition (IISD, 1992), 'human and natural resources' can be interpreted as human and natural capitals (defined below); for Hawken (1993), 'the capacity of the environment to provide for future generations' can be understood as a reference to the sufficiency of natural capital; for Wackernagel and Rees (1996), living 'within the means of nature' means living within the means of natural capital; for Elkington (2008), his three bottom lines are explicitly tied to corresponding capitals in his seminal work on the subject, as social, economic, and natural capital, respectfully (Ibid., pp. 74-86); Porritt, in turn, bases his entire outlook on what he calls the *Five Capitals Framework* (2005, Chapter 6); Jorna (2006), for his part, can be understood to be referencing social and natural capitals, respectively, when he speaks of the 'social and natural environment'; Savitz speaks of 'living creatures' and the 'environment' in ways that clearly evoke natural capital; and the WBCSD makes similar allusions to natural, social, and human capital (all, again, defined below).

For every one of these scholars - and many others, as well (see, for example, Costanza and Daly, 1992; Nahapiet and Ghoshal, 1998; Ekins et al, 2002; Vemuri and Costanza, 2005; and Mulder et al, 2005) - what determines the sustainability of human activity is the impacts it has on various forms of vital capital. This is the CTA approach to sustainability theory and practice, and we subscribe to it.

3.4.1 Herman Daly's principles of sustainability

Herman Daly, a well-known former World Bank economist, co-originated the field of ecological economics, a transdisciplinary attempt to unite economics and ecology (Daly, 1996, p. 73; Costanza et al, 1997, Chapter 2). He and other - if not all - ecological economists, adhere to CTA in some form or another as a foundational principle in their thinking (Costanza et al, 1997, p. 107). Natural capital, in particular, figures prominently in the related literature. In that regard, human economies are seen as subsystems of the global ecosystem and not apart from it (Daly, 1996, pp. 6-7; Costanza et al, 1997, p. 7). The implications of this, in terms of what it would mean for a society or an economic system to be sustainable, are succinctly put forward by Daly (1990) as follows:

> "For the management of renewable resources there are two obvious principles of sustainable development. First that harvest rates should equal regeneration rates (sustained yield). Second that waste emission rates should equal [or not exceed] the natural assimilative capacities of the ecosystems into which the wastes are emitted. Regenerative and assimilative capacities must be treated as natural capital, and failure to maintain these capacities must be treated as capital consumption, and therefore not sustainable" (p. 2).
> .....
>
> "There remains the category of nonrenewable resources which strictly speaking cannot be maintained intact short of nonuse [...] Yet it is possible to exploit nonrenewables in a quasi-sustainable manner by limiting their rate of depletion to the rate of creation of renewable substitutes.
>
> The quasi-sustainable use of nonrenewables requires that any investment in the exploitation of a nonrenewable resource must be paired with a compensating investment in a renewable substitute (e.g., oil extraction paired with tree planting for wood alcohol)" (Ibid., p. 4).

Meadows et al (1992), for their part, embraced and summarized Daly's three principles as follows (p. 209):

> "In order to be physically sustainable [a] society's material and energy throughputs would have to meet economist Herman Daly's three conditions:
>
> 1. Its rates of use of renewable resources do not exceed their rates of regeneration;
> 2. Its rates of use of nonrenewable resources do not exceed the rate at which sustainable renewable resources are developed;
> 3. Its rates of pollution emission do not exceed the assimilative capacity of the environment."

Here we wish to make two general observations regarding Daly's three principles, or rules, that are important to our thesis. The first is that, as Meadows et al point out, Daly's principles deal exclusively with the ecological impacts of human activities on natural capital. There is no standard of performance or criterion for social sustainability in his formulation, except to the degree that environmental degradation can ultimately have impact on human well-being. Still, his formulation is expressed in terms of impacts on natural capital only, and there is no reason to believe that he has anything other than that in mind.

Our second point is to simply observe that Daly's formulation is a highly quantitative and almost operational one. Not only does he provide mathematical conditions or criteria for sustainability, he implicitly tells us how to operationalize a corresponding measurement and reporting scheme. To assess the ecological sustainability of a human social system, one need only measure and compare the related rates of resource use and waste emissions with the corresponding rates of renewable resource regeneration, sustainable renewable resource development, and waste assimilation rates, respectively.

Several years after modern definitions of sustainability began to take *sustainability context* into account, Daly arguably took things to the next level and single-handedly specified sustainability in a more granular and executable form. No doubt he was influenced when he did by his former teacher, Georgescu-Roegen, who had earlier made statements like, "We need no elaborated argument to see that the maximum of life quantity requires the minimum rate of natural resource depletion" (Georgescu-Roegen, 1999[1971], p. 21). Nonetheless, Daly was arguably the first economist to extrapolate the methodological implications of such statements, and thereby lay the foundations for what we prefer to think of today as *hard* (as opposed to *soft)* sustainability theory and practice - a general

approach to measuring, reporting, and managing the sustainability performance of human social systems using quantitative standards, or thresholds of performance, as a basis for doing so.

The issue for us, then, has been whether or not a similar solution can be found for assessing the *social* sustainability of an organization or society. We think the answer is yes, and we credit Daly for the example he set on the ecological side of the subject, which we, in turn, have relied upon as inspiration for the Social Footprint Method.

3.4.2 Capital stocks and flows

Before getting into the substance of our own theory on what it might mean for a society, or organization, to be socially sustainable, we should briefly pause here and be clear about what we mean by *capital*. Indeed, our entire approach to sustainability measurement and reporting is predicated, in large part, on the value and usefulness of the term as it applies to our thesis. Here we turn to the field of Ecological Economics (Costanza et al, 1997), which for many years has been using the term in a particular way that we find useful. Consider, for example, the following statement (Costanza and Daly, 1992, p. 38):

> "Since 'capital' is traditionally defined as produced (manufactured) means of production, the term 'natural capital' needs explanation. It is based on a more functional definition of capital as 'a stock that yields a flow of valuable goods or services into the future'. What is functionally important is the relation of a stock yielding a flow - whether the stock is manufactured or natural is in this view a distinction between kinds of capital and not a defining characteristic of capital itself."

In this thesis, we largely embrace the above definition of capital, but prefer a more general form of it as follows:

Capital is a stock of anything that yields a flow of valuable goods or services into the future.

Our addition of the phrase *'of anything'* (in line with Porritt, 2005, p. 112) is intended to help pave the way for the inclusion of non-material things as types or categories of capital that are important to us, but which are not necessarily important to ecological economists. Indeed, our notion of social sustainability will rely very heavily on the existence of non-material forms of capital, which it is now time to discuss.

3.4.3 Anthro capital

Given the definition of capital provided above, we can differentiate between two very broad sub-classes of capital as consisting of natural capital, on the one hand, and human-made capital, on the other. In providing us with a working definition of natural capital, Hawken et al make this same point as follows (1999, p. 151):

> "Natural capital can be viewed as the sum total of the ecological systems that support life, different from human-made capital in that natural capital cannot be produced by human capital [or by humans]."

Here we can say that human-made (or non-natural) capital is anthropogenic - as in *produced by humans* (see, for example, Schultz, 1961; Coleman, 1988; McElroy et al, 2006). From this point forward, then, we will refer to such anthropogenic capital, or capitals, as simply *anthro capital.*

3.4.3.1 Anthro capital defined

In total, we recognize four types of anthro capital:

1. financial capital,
2. human capital,
3. social capital, and
4. constructed, or built, capital.

Since many means of measuring, reporting, and accounting for the impacts of human activity on financial capital already exist, we will not discuss that form of anthro capital any further. In this thesis, we are only concerned with how to

measure, report, and account for the impacts of human activities on *non-financial, non-natural capitals.* Here, then, is how we define the three remaining anthro capitals of interest to us:

1. *Human Capital*
   Human capital consists of *individual* knowledge, skills, experience, health, and ethical entitlements that enhance the potential for effective individual action and well-being (Mincer, 1958; Schultz, 1961; Becker, 1993[1964]).
2. *Social Capital*
   Social capital consists of *shared* knowledge and organizational resources (e.g., formal or informal networks of people committed to collaborating with one another with the intent of achieving common goals) that enhance the potential for effective individual and collective action and well-being in human social systems (Coleman, 1990; Putnam, 2000; Ostrom and Ahn, 2003; McElroy et al, 2006).
3. *Constructed Capital*
   Constructed capital (or 'built' capital) consists of *material objects and/or physical systems or infrastructures* created by humans for human benefit and use. It is the world of human artifacts, in which human knowledge is also embedded. Constructed capital includes instrumental objects, tools, technologies, equipment, buildings, roads and highway systems, power plants and energy distribution systems, public transportation systems, water and sanitation facilities, telecommunications networks, homes, office buildings, etc. (Daly, 1973, 1977; Daly and Cobb, 1989; Costanza et al, 1997).

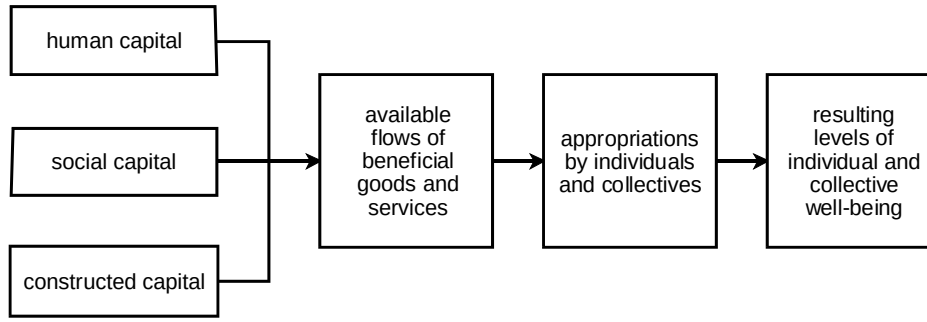
3.4.3.2 Importance for human well-being

In Chapter 1, we introduced the idea that certain types of capital are vital to the achievement of human well-being. In this sense, capital can be seen as a resource that yields valuable goods and services, which humans consume or appropriate in order to satisfy their needs (see Figure 3.1). Nowhere is this better understood, perhaps, than in the ecological arena, where *nature's services* are appropriated by humans on Earth (and other creatures) every day in order to make life possible. Here, for example, is how Daily puts it (1997, p. 3):

> "*Ecosystem services* are the conditions and processes through which natural ecosystems, and the species that make them up, sustain and fulfill human life. They maintain biodiversity and the production of *ecosystem goods*, such as seafood, forage, timber, biomass fuels, natural fiber, and many pharmaceuticals, industrial products, and their precursors."

This is clearly reminiscent of the definition given above for capital, according to which capital is a stock of anything that yields a flow of valuable goods or services into the future (to agents who need them). In the case of natural capital, what gets yielded is a flow of valuable ecosystem goods and services into the future. Humans appropriate them, and their well-being is served, accordingly (again, see Figure 3.1).

Figure 3.1 Anthro capital flows and human well-being



But what of anthro capital and its appropriation? Can we not make the same argument for flows that emanate from non-financial, non-natural, anthro capitals? Indeed we think we can. Starting with human capital, economic studies have shown that increases in the stock of human capital generally lead to higher per capita incomes (Becker, 1993[1964], p. 334), and also to more developed or advanced economies (Ibid., p. 345). Beyond that, it seems safe to assume that greater and more truth-like knowledge of and about the world (an aspect of human capital) - both as it is and ought to be - generally leads to more effective action, as we took great pains to assert in Chapter 2. As Schultz put it (1961, p. 16), "It simply is not possible to have the fruits of a modern agriculture and the abundance of modern industry without making large investments in human beings."

Social capital, for its part, also plays an important role in human well-being. Here again we see the telltale sign of valuable flows being appropriated in the *service of actions* being taken in order to ensure human well-being. As Ostrom and Ahn put it (2003):

> "Contemporary theorists of social capital, almost without exception, open their discourse on social capital by placing the problem of collective action at the center of economic and political problems" (p. xiii).
> .....
>
> "The fundamental theoretical question is how collective action is achieved" (pp. xv-xvi).
> .....
>
> "That social capital, as a concept, acquires its analytical meaning primarily in relation to collective action is a growing consensus (not just our contention) among the leading contributors to this issue - despite substantial differences among them" (p. xxxv).

As in the case of human capital, social capital yields valuable goods and services that people need in order to live safe, healthy, and happy lives. For the most part, this comes in the form of products and services that are produced by networks of individuals who cooperate with one another in order to achieve common goals and purposes. Indeed, organizations and businesses, themselves, are instances of social capital, as are governments and militaries. Individuals and groups, in turn, appropriate related goods and services from them, as needed, in order to fulfill their needs. In this way, we manage to get things done that we couldn't otherwise do as individuals, and so the state of our well-being improves accordingly.

Constructed, or built, capital is the only form of non-financial, non-natural capital that is physical in form, not counting the humans themselves that make up human and social capital. Indeed, it is completely material. Here we have in mind all of the so-called physical necessities in life, such as clothing and housing, and the vast array of technological systems and artifacts we rely on in our daily lives. These include not only tools, automobiles, and other objects of instrumental use to us as individuals, but also things of importance at the social or collective level of analysis (e.g., transportation systems, utilities, cities, marketplaces, schools, hospitals, military systems and technologies, scientific equipment, etc.). Assum-

ing these things are good for us, we routinely appropriate them, and the goods or services they provide, in the service of our well-being. And like the other forms of anthro capital of interest to us here, they are anthropogenic - we create them.

3.4.3.3 Internal versus external impacts

An organization's impacts on anthro capital can either be internal or external. By internal we mean within an organization, especially with regard to employees; by external we mean outside an organization, especially with regard to individuals and groups in society at large. An example of an internal impact on anthro capital might be the sufficiency of wages paid to employees, or the extent to which women are treated as equals with men. An example of an external impact on anthro capital might be the favorable economic effect a company has on other businesses by virtue of the goods and services it procures from them. Corporate philanthropy is another case.

3.4.3.4 An impact ontology for organizations

In general, there are many, if not unlimited, possible conditions or areas of impact (AOIs) in society that a company can have impact on as a consequence of its operations. Each such AOI is merely an analytical aspect, or condition, of society as seen from the perspective of an observer. Moreover, such conditions can be highly abstract and difficult to measure, such as *happiness;* or they can be more concrete and easily ascertainable, such as *teenage pregnancy rates*.

In this thesis, it is not our intent to specify or prescribe an ontology of AOIs, much less an index or set of indicators, for human well-being. Rather, we have set out to create a design specification for a measurement model that can be used with any number of indicators to assess the social sustainability of an organization's impacts on anthro capital. Exactly which indicators to use, or which AOIs to focus on, is for the individual practitioner to determine, not us. That said, we have prepared an ontology of AOIs that can be used as a starting point (see Appendix B). It is a hypothetical list only, and can be modified, as needed, to suit the needs of individual practitioners or organizational situations.

In general, AOIs can be grouped into two categories: internal impacts and external impacts. In each case, anthro capital can be found in the form of human, social, and constructed capital (again, see Appendix B). Internal impacts mainly involve effects on employees, but always in terms of the three types of anthro capital we have defined (human, social, and constructed). Thus, corporate training programs might enhance employee-related *human* capital, whereas the illicit use of child labor would clearly diminish it. Internal *social* capital might include strong organizational learning policies, or child care programs for working parents. And company-sponsored *constructed capital* might include on-site fitness centers, or other workplace-based facilities designed for employee benefit and use.

Turning to external impacts, a company's willingness to fund individual scholarships or offer assistance of other kinds to individuals could be regarded as impacts on human capital. Similarly, contributions aimed at improving social institutions, such as schools, hospitals, and social services programs would constitute impacts on social capital. And any effect on enhancing, or degrading, the quality or sufficiency of physical resources, such as roads or transportation systems would amount to effects on *constructed* capital.

In total, there are six categories, or areas, of social impact organizations can affect as a consequence of their operations. Each of these categories is defined below:

1. ***Internal Areas of Impact***
   - *Human Capital* (Direct Contributions to Workers):
     These are direct contributions to (or impacts had on) *individuals* internal to an organization, which in turn constitute personal human capital resources for its members, workers, or stakeholders.
   - *Social Capital* (Contributions to Social Programs and Resources):
     These are contributions to (or impacts had on) *programs and institutions* internal to an organization, which in turn constitute, or have impact on, shared social capital resources and services available to its members, workers, or stakeholders.
   - *Constructed Capital* (Direct Contributions Within Own Enterprise):
     These are contributions to (or impacts had on) the presence or quality of *human-made infrastructures and/or material goods* internal to an organization.

2. ***External Areas of Impact***
   - *Human Capital* (Direct Contributions to Individuals in Society): These are direct contributions to (or impacts had on) *individuals* in society external to an organization, which in turn constitute personal human capital resources for such individuals.
   - *Social Capital* (Contributions to Social Programs and Resources): These are contributions to (or impacts had on) *third-party programs and institutions* in society external to an organization, which, in turn, constitute or have impact on social capital resources and services available to individuals and collectives in society.
   - *Constructed Capital* (Direct Contributions to Social Resources): These are contributions to (or impacts had on) the presence or quality of *human-made infrastructures and/or material goods* in society external to an organization.

Given the sheer number of social conditions or AOIs that an organization's operations can affect, not to mention the many competing points of view about how best to classify or express them, it is unlikely that any sort of comprehensive social sustainability bottom line can ever be produced for a single organization. Instead, AOIs will have to be selected on the basis of relevance, materiality, or priority (see, for example, Porter and Kramer, 2006, discussed further below in Section 4.6.1.2.2). Certainly not all organizations have impact on all of the AOIs shown in Appendix B, nor do all organizations have impact on all of the AOIs that some people think they should. We make no prescriptions here.

To conclude this section, it is perhaps worth mentioning at this juncture that the classification of AOIs discussed above is a direct result of design decisions made on the forward engineering side of our methodology, following discoveries made on the reverse engineering side (see Section 1.5). Once we had identified the critical role that the concept of natural capital plays in existing ecological sustainability measurement tools, such as the Ecological Footprint Method, we then focused on the question of what sort of capital(s) should be used in the measurement of social sustainability. *Anthro* capitals was our answer, and the six areas of impact described above were then specified in more detail, as a deliberate act of forward engineering design (see Section 4.6.1.2 below for a more detailed discussion of how the classification of AOIs set forth above is applied in the Social Footprint Method).

3.5 A THEORY OF SOCIAL SUSTAINABILITY

Next we wish to turn our attention to the explication of our own theory of sustainability, in order to lay the theoretical foundation required to introduce the Social Footprint Method in Chapter 4. Central to our thinking will be the *sustainability quotients* concept put forward below, and the return to, and integration of, the epistemological perspective presented in Chapter 2. The remainder of this chapter is structured, accordingly.

3.5.1 Sustainability quotients

We contend that the sustainability performance of a human collective can be usefully expressed in the form of mathematical quotients. This is true for impacts on both natural and non-natural, or anthro, capital. The Ecological Footprint Method, for example (Rees, 1992; Wackernagel and Rees, 1996), essentially expresses human impacts on natural capital as numerators, and then measures them against ecological limits, or constraints, which we can think of as denominators. Thus, according to the Global Footprint Network (www.footprintnetwork.org), the current human impact on the Earth's ecology exceeds the planet's capacity to support them by at least 23 percent (Global Footprint Network, 2007). Expressed in the form of a quotient, humanity's *ecological bottom line*, therefore, is at least 1.23.

As we will explain below, any quotient, or score, of greater than 1.0 for an ecological reading is unsustainable, simply because it indicates that impacts are exceeding the limited, or constrained, capacity of related systems (capital) to withstand them. When this happens, capital stocks diminish and ultimately disappear, taking their flows of valuable goods and services with them.

More than anything else, perhaps, this simple principle forms the basis of sustainability measurement and reporting in its most literal form (i.e., maintaining the quality and sufficiency of vital capitals is the most important principle of sustainability). Thus, as we contemplate the extension of measurement principles from the ecological arena to the social domain, this basic principle must be upheld and respected in some way. A good start would be to understand the concept of carrying capacity that lies behind it.

3.5.2 The concept of carrying capacity

Earlier we defined *capital* as a stock of anything that yields a flow of valuable goods or services into the future. Now we wish to connect the notion of capital *flows* with the ecological concept of carrying capacity, so that we can later extend it to our own notion of anthro capital and to the functioning of the Social Footprint Method.

In the ecological literature, *carrying* capacity is defined as 'the maximum population size that can be supported indefinitely by a given environment' (Begon et al, 1996, p. 955). In the sustainability literature, however, the term is sometimes used in an inverted sense (Rees, 1992; Wackernagel and Rees, 1996; Rees, 2003). Instead of referring to the population size that an environment can support, we can specify an environment size required to support a population. Thus, we can speak of carrying capacity as a requirement, and not just a de facto condition.

3.5.2.1 The carrying capacities of capitals

Stocks of capital have carrying capacities, the dimensions of which are determined by the size and content of their flows. When the scale of human demands placed on such capitals exceeds the dimensions of their flows, we can say that the impact of human activity has exceeded the carrying capacities of the capitals involved. Or we could say that the carrying capacity of the capitals involved is insufficient to accommodate or support the impacts of human activities. Either way, we have a mismatch between the demand for flows and the available supply. This, in so many words, is one way of defining a state of *unsustainability.*

In the case of flows available from natural capital, humans are more or less stuck with their size and type. We can certainly leverage technology to wring increasingly more and more out of the same capital stock over time - and indeed we have - but the one thing we cannot do is create more natural capital than is already here on Earth. Nor can we recover or recycle energy already spent. Both of these principles are fairly well ensconced in the first and second laws of thermodynamics, respectively.

Anthro capital, on the other hand, has the distinctive feature of being human-made. Within reasonable (and far reaching) limits, we can always make more of it if we choose to. For example, we can invest in, and cultivate, individual knowledge, skills, and capabilities (human capital); or we can do the same for collective knowledge and capabilities (social capital); and also for material necessities (constructed capital). Indeed, to the extent that deficiencies in human well-being can be attributed to shortages in the supply of anthro capital, we not only have the ability to take compensatory steps, we very much ought to. Unlike natural capital, of which we have only limited supplies, we can always increase the carrying capacity of anthro capital given the will to do so. In this thesis, we take the position that that is exactly what humanity ought to do when faced with shortages, and that the persistent failure to do so is unsustainable - *socially* unsustainable, that is. Here we rely on a principle of well-being: that well-being is not only desirable, but that the absence of well-being can lead to other equally undesirable outcomes, such as civil strife, violent conflict, and political instability.

3.5.2.2 Indicators of human well-being

There are many alternative, if not competing, indicator schemes in existence today for measuring and reporting the state of human well-being at the regional, national, and global levels. These include composite indicators such as the Human Development Index (UNDP, 2006a), the UN's *Millennium Development Goals* (MDGs), the UN's *Commission on Sustainable Development* (CSD) indicators, the World Bank's *World Development Indicators* (WDIs), and many others. Some sources have even gone so far as to combine aspects of multiple indices into meta-indices. Cherchye and Kuosmanen, for example (2006), combine aspects of 14 well-known indices into a single, synthesized sustainability index.

Separate and apart from the kind of *objective* indicators discussed above has recently come an entirely new and different class of *subjective* schemes (McGillivray and Clarke, 2006). Such subjective schemes tend to focus on happiness as the principal indicator of well-being, including consideration of "cognitive judgements of life satisfaction and effective evaluations of emotions and moods" (McGillivray and Clarke, 2006, p. 4; see also: Diener, 1984; Argyle, 1987; Diener and Larsen, 1993; Eid and Diener, 2003). One particularly extensive index, or database, of subjective happiness, the *World Happiness Database* (Veen-

hoven, 2004), contains 2300 surveys from 112 countries, dating from as far back as 1946 to the present day.

Very shortly we will put forward the proposition that the social sustainability performance of an organization is a function of the extent to which it meets its moral obligations to help close gaps in human well-being. This immediately raises the question of which indicator scheme to rely on as a basis for identifying such gaps, and also whether or not consensus exists for any one of them as the best or most preferable one to use. McGillivray and Clarke (2006) comment on this issue as follows (p. 6):

> "Identifying an exhaustive list of [well-being indicators] is no easy task. Getting general agreement on the list and the relative importance of each component would appear to be an impossible task. It follows that identifying an exhaustive list of measures that all could agree on is also an impossible task."

Implicit in this statement is the premise that in order to effectively assess the state of human well-being, consensus is required regarding the metrics or indicators that should be used to do so. In this thesis, we flatly reject such a claim, and we do so on epistemological grounds. In effect, the choice of an indicator, or set of indicators, is a value decision, just as the state of human well-being that ought to obtain is also a value claim. As we made abundantly clear in Chapter 2 (we hope), consensus has nothing to do with truth or legitimacy. Rather, the legitimacy of a value claim or choice is a function of how well it survives criticism when pitted against other, competing claims. To invoke consensus as a basis for justifying either a descriptive or evaluational claim is to commit the argumentative fallacy of *appeal to authority* (Kahane, 1976, p. 7). The authority in this case simply happens to be the *consensus* or *the majority* in a population.

As we will explain further below, an important early step in measuring the social sustainability performance of an organization (using the Social Footprint Method we will propose) is to select a standard of human well-being of some kind, along with a corresponding metric or indicator. Given the argument above, such a choice should never be made on the basis of consensus, nor should the attempt to measure sustainability performance ever be abandoned because of the absence of consensus. All that is required, instead, is:

1. an informed choice of one standard of well-being or another,

2. a willingness to admit the fallibility of making such choices, and
3. a similar willingness to embrace a better choice in the future as one's knowledge improves.

Once we let go of our need for consensus and certainty, the way forward opens up to us - trial and error can begin. Here, then, we begin to see the powerful influence of our Popperian, fallibilist epistemology on the business of measuring and reporting organizational sustainability.

3.5.3 Measuring sustainability with quotients

As earlier noted, it is our contention that sustainability claims and assessments of the sustainability performance of organizations - and other human social systems, for that matter - can be represented mathematically in the form of quotients. This is true, we believe, for sustainability performance of either an ecological or social kind. The resulting constructs are what we call *sustainability quotients.*

3.5.3.1 A binary performance scale

In order to be meaningful, sustainability quotient scores must be plotted on a performance scale of some kind. Various such scales for recording the sustainability performance of human collectives are at least implicitly found in the literature. Even the very common use of predicates such as 'is more sustainable' or 'is less sustainable' seem to invoke a scale(s) of some kind, along which the sustainability performance of a collective can be mapped. Our interest, then, is to make such scales explicit, and to select or suggest one that will serve our purposes. To do this, we must first again hearken back to the history of sustainability theory and practice, in order to discover the various scales that have already been used or referred to over the years

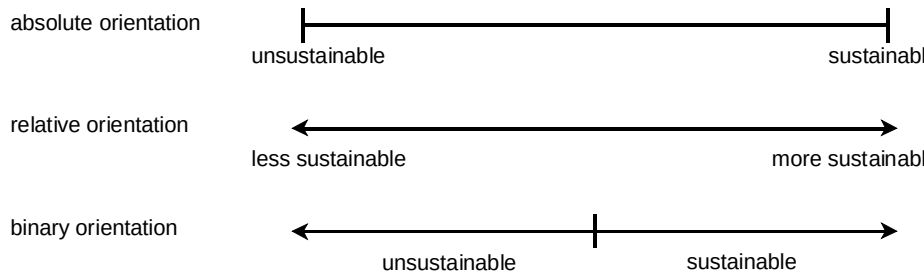
Faber et al (2005) provide a useful conceptual framework through which we can view such historical and competing schools of thought. We will use their framework here in our analysis of past and present practices, but will also expand on it as we offer our own perspective on what sustainability means, and what its prac-

tical measurement and reporting implications are at an organizational level of analysis.

According to Faber et al (Ibid.), all sustainability theories or perspectives that involve a concept or notion of sustainability have a *goal orientation* of some kind. They define this term as follows:

Goal Orientation - This aspect of sustainability theories deals with "the point of reference that is used in determining whether an artifact is sustainable" (Ibid., p. 8). A distinction can be made, accordingly, between *absolute* versus *relative* lines of reasoning. "The absolute approach to sustainability identifies a continuum [or a scale] with two extremes: non-sustainable and sustainable [at opposite ends]" (Ibid.). By contrast, a "relative approach starts with the present state of affairs and identifies existing problems, which people subsequently attempt to solve. It is an approach of small steps instead of a grand design. In contrast to the absolute approach, the focus of this relative approach is not the [absolute] good, but the less worse or the better" (Ibid.).

Figure 3.2 Alternative goal orientations for sustainablity theories



We propose a new *goal orientation,* in the Faber et al sense of the term, that we call the *binary* orientation. According to the *binary* orientation, an artifact is sustainable, or not, depending on which side of a demarcation point it falls on a scale of *sustainability performance* (see Figure 3.2). Thus, the binary conception of sustainability is, in a sense, a variant of the *absolute* goal orientation, in that it is completely anti-relativistic. According to the binary orientation, an artifact is either wholly sustainable or not - there is no in-between. Instead, there are only higher or lower scores for *sustainability performance,* some of which fall on the *Sustainable* side of a line, and others of which fall on the *Unsustainable* side.

While similar to the absolute orientation, the binary orientation differs from it in one important way: it rejects the notion that an artifact can be more or less sustainable without being entirely one or the other in the first instance *(Sustainable* or *Unsustainable).* In our view, the absolute orientation may at least implicitly suggest and encourage the opposite *more or less*, or relativistic, interpretation of sustainability, given the territory that lies in between its *Sustainable* pole at one end and its *Unsustainable* pole at the other. Presumably, the closer an artifact is to the *Sustainable* pole, the more sustainable it is, and vice versa. The binary orientation has no such ambiguity.

Let us take our binary theory to the next level, then, and endeavor to explain how a pattern of behavior can come to occupy one side of a demarcation point or another on the kind of sustainability performance scale we have in mind. To do this, we must first explain the concept of *sustainability performance* and how it differs in the ecological and social contexts, respectively. We start with the ecological context.

3.5.3.2 Measuring ecological sustainability performance

To compute sustainability quotients, we must be able to quantify human impacts on vital capitals, both as they are and as they ought to be. This is perhaps most easily accomplished in the ecological domain where physical conditions prevail. In the ecological context, denominators in sustainability quotients represent ecological limits or constraints, which if exceeded by the effects of human activity (quantified in the numerator) should be seen as indicative of unsustainable performance. Here we are talking about impacts on natural capital, and so it may be helpful to think of such impacts as involving consumption, or rates of consumption (of the flows, if not stocks, of natural resources), in particular.

Notice, as well, that our concept of ecological sustainability quotients makes it possible to operationalize Daly's three principles (1990) in a systematic way. In effect, when we do this, we see that there are three sub-types of ecological sustainability quotients to work with:

1. one that deals with renewable resources,
2. one that deals with non-renewable resources, and
3. another that deals with wastes.

To be even more specific, the value given to a quantity expressed in the denominator of our quotients should consist of some level or degree of natural resource flows that can be allocated, in principle, to a human collective. Later on we will show how this can be done in an organizational context, where the choice made about the allocation to a business can be thought of as a not-to-exceed limit, the size of which is determined by the number of employees who work for the organization. At base, then, the denominator consists of a normative proposition regarding how much of the Earth's natural resources or services an organization is entitled to consume in a given period of time. Thus, it is an ought statement - albeit one which is always tied to a need to constrain the consumption of carrying capacity in natural capital (i.e., beneficial flows of ecological goods and services as required by a population) at specific levels.

Figure 3.3 Sustainability quotients for ecological impacts

$$\text{ecological sustainabitilty performance} = \frac{\text{net actual impact on carrying capacity of natural capital resulting from organizational activity}}{\text{net normative impact on carrying capacity of natural capital resulting from organizational activity}}$$

The numerator, for its part, is an *is* statement. It is an expression of what an organization's impacts on the carrying capacity of natural capital has actually been during the same period. When we combine the two elements of such (ecological) quotients, we can compute the resulting scores (see Figure 3.3).

In the case of ecological sustainability quotients, the following rules for interpreting such scores are then applied (i.e., except in cases where the use of proxies may suggest otherwise, as explained in Chapters 4 and 5):

For scores of ≤ 1, related behaviors are *Sustainable*
For scores of >1, related behaviors are *Unsustainable*

Before moving on to our discussion of societal quotients, we want to acknowledge here that our ecological quotients are substantially consistent with the structure and form of the Ecological Footprint Method (EFM) (Rees, 1992; Wackernagel and Rees, 1996). While perhaps not expressed as quotients, per se,

the calculations made when using the EFM arguably do reduce to quotients. On the other hand, the EFM relies on proxy units of measurement for expressing the values contained in its numerators and denominators (i.e., biologically productive land, or hectares), whereas our (ecological) quotients are more literal. In any case, as we have already noted, it is not our intent to put forward a competing approach to the EFM. Rather, we have taken inspiration from it and are attempting to put forward:

1. a more generalized conception of sustainability measurement and reporting, and
2. a new and complementary approach for computing the social sustainability performance of human collectives.

Let us now turn our attention to precisely that.

Figure 3.4 Sustainability quotients for social impacts

$$\text{social sustainabitilty performance} = \frac{\text{net actual impact on carrying capacity of anthro capital resulting from organizational activity}}{\text{net normative impact on carrying capacity of anthro capital resulting from organizational activity}}$$

3.5.3.3 Measuring social sustainability performance

Above we explained that denominators in ecological sustainability quotients consist of normative propositions about how much carrying capacity of natural capital an organization is entitled to consume. Numerators, in turn, consist of statements about how much natural capital an organization has *actually* consumed, and the resulting quotient scores are then computed, accordingly.

In the case of social sustainability quotients, the logic of things reverses. Rather than think of and express sustainability performance in terms of consumption, we speak instead in terms of *production* (see Figure 3.4).

This is due to the fact that in the case of social sustainability performance, we are dealing with anthro capital, not natural capital; and since anthro capital is human-

made, there are no naturally imposed limits to its supply, other than human time on Earth available to produce and maintain it. In almost all cases where deficiencies exist in the amount of anthro capital needed to ensure human well-being, people generally have the option to simply create more of it.

Thus, the standard of performance in the case of anthro capital is not a *not-to-exceed* one; rather, it is a *not-to-fall-below* one. Whereas duties in the case of *natural* capital, then, are about shares to be *consumed*, in the case of *anthro* capital, they are about shares to be produced and/or maintained. In the social case, therefore, norms are expressed in terms of what is needed to ensure beneficial flows of *anthro* capital goods and services to a defined population, at whatever levels are required to ensure basic human well-being. Solving problems associated with ecological and social unsustainability therefore reduces to a need to either lower the demand for, or increase the supply of, vital capitals, respectively.

Here we acknowledge the moral and ethical implications of our stance, namely that the well-being of all humans is desirable, and that people have an obligation to contribute to ensuring the well-being of one another. Indeed, we think that in the absence of such an obligation, there would be no concept of social sustainability, nor any need for it, since sustainability always entails the measurement of performance (expressed by numerators in our quotients) against standards or norms of performance (expressed by denominators in our quotients). To be sustainable is to live up to a particular kind of moral responsibility, a kind that places value in human well-being and the production and/or maintenance of related vital capitals.

To go one step further, while there are two basic variants of sustainability quotients (ecological and societal), we think we can represent the idea in a more abstract, generic form. In so doing, we can interpret the concept of sustainability performance as follows:

> Sustainability performance (S) is the quotient of actual human impacts on the carrying capacities of vital capitals (A), over normative human impacts on the carrying capacities of the same capitals (N) (see Figure 3.5).

In all cases, in order to be sustainable, the effects of human impacts on vital capitals must not diminish the quality or sufficiency of their carrying capacities, as

required to meet human (and non-human, in some cases) needs for basic well-being. Furthermore, with regard to impacts on anthro capital, such impacts might also involve the need to *produce* capital in cases where:

1. it is insufficient to meet human needs, or
2. an organization or collective has a demonstrable share of the duty, or obligation, to produce and/or maintain related stocks.

Figure 3.5 The sustainabilty quotient

$$S = A/N$$

where:

S = sustainabilty performance*
A = net actual impacts on the carrying capacities of vital capitals
N = net normative impacts on the carrying capacities of vital capitals

* for ecological quotients: S scores of ≤ 1 are sustainable, > 1 are unsustainable;
for societal quotients: S scores of ≥ 1 are sustainable, < 1 are unsustainable

3.6 THE PHILOSOPHY OF SUSTAINABILITY

Thus far in this chapter we have concerned ourselves mainly with the intellectual history of sustainability theory and practice, and with our own views on how to think of, and express, sustainability performance in terms of quotients. Now we want to go deeper into the content of such quotients, starting with an evaluation of the kind of normative assertions they make, using the concepts we presented in Chapter 2. This will help lay the foundation for our epistemological theory of sustainability, the full substance of which we will present in Section 3.7 below.

3.6.1 Value theory and sustainability

It is our contention that sustainability claims, or claims about sustainability performance, are primarily about values. While it is true that they also comprise assertions about factual states of affairs (i.e., regarding the actual impacts of human activities), all sustainability claims or statements are ultimately grounded in views about the way the world ought to be. To say that a pattern of behavior,

such as the operations of a company, are sustainable is to say that such activities do not conflict with norms or standards of performance for how such operations ought to be. The entire matter, then, invariably turns on the question of what one's standards of performance are, and whether or not they have been met. That said, it should be clear that *standards of performance* are fundamentally and utterly normative in content.

The social science of sustainability, then, is the study of human impacts on vital capitals, and of whether or not such impacts conform to related standards of performance. The nature and origin of such standards are therefore of great interest to us, as is the very choice of sustainability, itself, as something we ought to focus on. There are two normative sides to the subject, then: one regarding the very choice of sustainability, the science, as something we *ought* to be concerned with; and a second involving the particular standards of performance that *ought* to be used when making sustainability performance determinations.

Following from the above, we can see that sustainability routinely makes, and relies upon, value claims, not just in the sufficiency of evidence and so forth, but in the substance of what it aims for (i.e., the target states it relies on as standards for human performance). Indeed, every time a sustainability determination is made by a sustainability practitioner, underlying value claims are invoked with regard to both the importance of sustainable practice in the conduct of human affairs, and the specific standards of performance being applied at the time. Let us consider this claim, then, in the context of the ecological and social domains so characteristic of sustainability measurement and reporting.

First, the ecological context. When we say that the consumption of a limited natural resource is unsustainable, we generally mean that if the related pattern of activity, or consumption, were to continue, the natural capital resource involved would disappear. But this, by itself, is not enough to warrant that the pattern involved should be discontinued. The disappearance of a natural resource is simply a factual state of affairs. Instead, it is the undesirability of the fact that leads us to devalue the behavior that produces it, whether it be rooted in intrinsic values or extrinsic values. In either case, the result is the same: the science of sustainability normatively exhorts humans to decrease their *consumption* of related (natural) capital.

Next, the social context. Here we have the same kind of thing going on. When we say that a pattern of behavior is socially unsustainable, we generally mean that if it were to continue, certain anthro capital conditions on Earth would either remain at present levels, or weaken. But this, again, is not by itself enough to warrant that the behavioral patterns involved should be discontinued; levels of anthro capital, be they high, low, or otherwise, are simply factual states of affairs. Rather, it is the undesirability of deficient levels of anthro capital that leads us to devalue the behavior that produces them, whether it be rooted in intrinsic values or extrinsic values. In either case, the result is the same: the science of sustainability normatively exhorts humans to increase their *production* of related (anthro) capital.

It should be clear, then, that statements or claims regarding the sustainability of human activities are shot through with values and normative propositions. There are always factual or descriptive states of affairs involved, but it is the undesirability or unfitness of certain facts that causes us to interpret the term *unsustainable* in the way that we do. Thus, to label an activity as *unsustainable* is to more or less condemn it as undesirable, unwanted, and not to be continued. In short, it is to make a value claim.

3.6.2 Moral responsibility theories and sustainability

The very idea that an organization, or more specifically its employees, can have social responsibilities raises many basic questions of moral philosophy, and the ethical framework that an organization can, or should, abide by. Our own view, for example, is that only people can bear moral responsibilities. Corporations, per se, as abstract, inanimate inventions of ours, cannot be held morally responsible for anything, notwithstanding the veritable *personhood* granted to them by governments and the courts in commerce. Indeed, only humans can act as moral agents, and make choices between right and wrong. Later on, the full value and implications of this perspective will become clear, as we show how the size of an organization's population can lead conveniently to a means for allocating ecological entitlements and social duties, as well as to various per capita metrics useful for doing sustainability measurement and reporting.

Still, to say that the moral accountability for corporate actions should rest with employees is not to specify a particular moral philosophy or framework of ethics. Rather, it is to beg the question. In the remainder of this section, then, we want to highlight and discuss a few such alternative philosophies, mostly with regard to human and organizational impacts on anthro capital. In cases where the philosophies we discuss coincide with our own views, we will acknowledge them as such, and will explain how they have impacted our thinking. Here it should be clear, however, that while we have, indeed, made several conceptual and theoretical commitments in the development of our thesis, many, if not most, of the moral choices required to measure and report organizational sustainability have been left open for others to make for themselves. And when they do, corresponding standards of performance will issue accordingly, thereby providing practitioners with precisely the kind of *context* they need to do meaningful sustainability measurement and reporting.

3.6.2.1 Complicity and collective guilt

The concept we wish to highlight here - and which we ourselves have embraced in this thesis - is *complicity:* the idea that individuals can be, *and are*, personally responsible for actions taken by the collectives of which they are a part, regardless of the extent of the roles they play as individual actors in their groups' behaviors (Kutz, 2000; Branscombe and Doosje, 2004). Kutz (2000), in particular, proposes a *Complicity Principle* as follows (p. 122):

> "***The Complicity Principle:*** (Basis) I am accountable for what others do when I intentionally participate in the wrong they do or harm they cause. (Object) I am accountable for the harm or wrong we do together, independently of the actual difference I make."

For our part, we fully embrace Kutz's complicity principle. We are particularly drawn to the means he proposes for attaching individual accountability to the consequences of joint acts, in cases where individuals are, in fact, voluntarily involved in the performance of such acts. Like ourselves, Kutz sees individuals as the logical loci of moral responsibility. He argues as follows (2000, p. 7):

> "Because individuals are the ultimate loci of normative motivation and deliberation, only forms of accountability aimed at and sensitive to what individuals do can succeed in controlling the emergence of collective harms. The oughts of morality and politics must apply to *me*. The trick lies, then, not in modifying the fundamental bearer of accountability, but in expanding the scope of individual accountability by including an assessment of what an individual does with others."

Here we wish to add that while most of what Kutz and others speak of in the context of collective guilt and complicity theory pertains to the consequences of action, we can also extend the notion to cases in which *failures* to act are involved. Thus, not only do individuals have moral accountability for the roles they play in collective action, so too do they have moral accountability for the roles they *fail to play* in collective *inaction*, in cases where such actions *ought to have been taken*. Kutz alludes to this side of his moral philosophy as follows (2000):

> "Grave harms occur because of what large numbers of people do or fail to do" (p. 6).
> .....
>
> "...intentional participation in a group's activities is the primary basis for normative evaluation, both when agents contribute to collective harms, and when they fail to contribute to collective goods" (p. 67).

Let us be clear, then, that the employee-centric moral philosophy upon which our thesis is based places just as much emphasis on the moral consequences of *not* taking actions that ought to have been taken, as it does on *taking* actions that should or should not have been taken.

3.6.2.2 Kant's Categorical Imperative

Another very important figure in the field of ethics and moral philosophy is, of course, Immanuel Kant. Here we refer, in particular, to Kant's notion of the Categorical Imperative (CI) (Kant, 2005[1785]), which he regarded as a '*supreme principle of morality'* (Ibid., p. 53). The issue for us is whether or not Kant's CI

could be a source of normative performance in business, insofar as organizational impacts on vital forms of capital is concerned.

Here we agree with Kutz (2000, pp. 132-138), in part, who roundly rejects the CI as a basis for accountability in group settings, precisely because of Kant's failure to take joint acts, complicity, and collective harms into account. Still, there are parts of the CI that play an important role in our thesis. The first, or root, formulation of the CI, known as the formula of universal law, for example, asserts that one's maxims should conform to the idea of a universal law (Denis, 2005, p. 22). Kant states this as follows (Kant, 2005[1785], p. 81):

> "There is therefore but one categorical imperative, namely, this: *Act only on that maxim whereby you can at the same time will that it become a universal law."*

With respect to our own thesis, there is much about Kant's moral philosophy and the CI itself with which we agree. Indeed, his reliance upon the notion of holding maxims subject to a test of universalizability, in particular, is central to our approach. On the other hand, his failure to explicitly recognize the special nature of joint acts, and to take marginal individual contributions to them and their outcomes into account is problematic. Here we agree with Kutz that Kant's moral philosophy is overly individualistic, and even, in a sense, solipsistic (Kutz, 2000, pp. 4-5). By adding Kutz to Kant, however, the problem is solved.

3.6.2.3 Rawls's theory of justice

Bruce Russett, a Professor of International Relations at Yale University, once wrote (1964, p. 442):

> "Remove the secondary causes that have produced the great convulsions of the world and you will almost always find the principle of inequality at the bottom. Either the poor have attempted to plunder the rich, or the rich to enslave the poor. If, then, a state of society can ever be founded in which every man shall have something to keep and little to take from others, much will have been done for the peace of the world."

This is just the sort of task that Rawls (1999[1971]) took up for himself in the name of *justice* only a few short years after Russett wrote those words. In his prodigious work, *A Theory of Justice* (Ibid.), Rawls defined his subject as "the way in which the major social institutions distribute [or ought to distribute] fundamental rights and duties and determine the division of advantages from social cooperation" (Ibid., p. 6). Like Russett, Rawls was concerned with the problem of inequality within humanity, and saw justice as the solution. Thus, he wrote (Ibid., p. 7):

> "It is these inequalities, presumably inevitable in the basic structure of any society, to which the principles of social justice must in the first instance apply."

Rawls approaches his subject from the perspective of social contract theory (see, for example, Hobbes, 1909[1651]; Locke, 1952[1689]; and Rousseau, 1927 [1762]), an approach we find attractive because of its normative sensibilities. Indeed, it is the concept of a social contract between an organization and society that can serve as a basis for, and source of, precisely the kinds of duties and obligations we have in mind for the denominators of our sustainability quotients (see Figure 3.5).

Rawls's conception of the social contract, however, is by no means specific to organizations. For him, the contract is one that should exist between all individuals in society. In order to derive a corresponding set of norms, Rawls imagines what he calls the "original position" (1999[1971], p. 10), a purely hypothetical situation between individuals in society in which basic principles of justice are proposed. From this position, Rawls asserts his two main principles of justice: the liberty principle and the difference principle. Here they are, respectively (Ibid., p. 266):

> "***First principle***
> Each person is to have an equal right to the most extensive total system of equal basic liberties compatible with a similar system of liberty for all.

Second principle

Social and economic inequalities are to be arranged so that they are both:

- to the greatest benefit of the least advantaged, consistent with the just savings principle, and
- a less than equal liberty must be acceptable to those with the lesser liberty."

The purpose of the first principle is to "define and secure the equal basic liberties" of individuals in society; while the purpose of the second principle is to govern, or regulate, the range of differences in equality of income, wealth, authority, and responsibility amongst individuals in a society that its members should regard as acceptable (Ibid., p. 53). Rawls's second principle also makes reference to a so-called "just savings principle", a moral standard, perhaps, for exactly the kind of inter-generational equity called for in the Brundtland Commission's definition of sustainable development (WCED, 1987, p. 8).

Finally, Rawls extends his ideas to institutions, as well, since after all, human social institutions are created (albeit jointly) by individuals, and are no less inhabited (and complicitly controlled) by them. So, too, for our commercial institutions. Thus, whatever social contracts we may have (or ought to have) between ourselves in a general sense arguably apply just as much inside the workplace as outside. This, in fact, may be the most powerful and legitimate argument for why organizations ought to think in terms of triple bottom line performance, and where their associated duties and obligations actually come from.

3.7 SUMMARY: AN EPISTEMOLOGICAL THEORY OF SUSTAINABILITY

In this chapter, we have put forward an epistemological theory of sustainability - a view of sustainability as a quality, or property, of things that is merely alleged, or asserted, in the form of knowledge claims. The particular things of interest to us, of course, are organizations and their activities, the latter of which can be claimed to be either sustainable or unsustainable, insofar as their impacts on vital capitals are concerned. Thus, to refer to an organization's activities as sustainable

or not is to simply make a knowledge claim regarding their impacts on such capitals - no more, no less.

Inherent in the making of sustainability claims is always a measurement of performance relative to some standard of performance, the former of which is a descriptive claim, the latter of which is a normative claim, and either of which may be correct or incorrect. We have suggested that such claims can be arranged in the form of sustainability quotients, with numerators representing actual performance, and denominators representing normative performance. Given a binary performance scale for plotting related outcomes, the possibility of quantitatively measuring and scoring organizational sustainability comes rushing into view.

Our epistemological account continued with an embrace of fallibilism, and our rejection of truth with certainty as a possibility in human experience. Truth as correspondence is only a regulative ideal for us, a directional beacon that pulls us one way and not another with the aid of related theories of evaluation, such as Popper's Critical Rationalism or Firestone's fair critical comparison theory. Thus, our only requirement for building the kind of sustainability quotients we have in mind is that we be equipped with normative and descriptive knowledge claims that have survived our tests and evaluations (i.e., through knowledge claim evaluation). Neither certainty nor consensus of opinion is required in order to make headway in the management and social science of sustainability.

Importantly, we completed our epistemological theory by roundly rejecting the relativistic view of values and norms, while embracing Hall's value theory of legitimacy, and the notion that there can be correspondence between value claims and the way the world ought to be; not just between fact claims and the way the world is. When taken together, these insights provide us with a robust design specification for a sustainability measurement model that can be used to assess the sustainability performance of organizations, in terms of a wide range of social and ecological conditions in the world. Indeed, if, as we claim, sustainability entails the study of performance against standards of performance, no such assessment can intelligently proceed without a solid grounding in epistemological theory, upon which claims about facts versus values can be made in a systematic way. By willfully embracing the kind of realist and fallibilist epistemology we describe above, the result, for us, is a methodology for assessing the social sustainability performance of organizations that we call the Social Footprint Method.

It should also be clear that in this chapter, we were able to address several of our research questions, especially those related to existing sustainability tools and methods, and the extent to which they:

1. actually measure and report sustainability performance in a literal (i.e., context-based) way,
2. can be reduced to the key principles that lie behind them, and
3. include social sustainability performance in their scope.

In general, we found that most leading tools and methods, such as GRI, do not measure the sustainability performance of organizations in any sort of literal way, and that only the Ecological Footprint Method (EFM) does. The EFM ,however, is limited to measuring human impacts on natural capital. No similarly literal tools or methods exist for measuring such impacts on anthro capital.

Accordingly, then, let us now turn our attention to the introduction of the Social Footprint Method in Chapter 4, where we will see how the epistemological theory of sustainability described in this chapter can be operationalized into a measurement model, and procedure, for measuring the social sustainability performance of organizations.

CHAPTER 4

THE SOCIAL FOOTPRINT METHOD

4.1 INTRODUCTION

In this chapter, we introduce and describe a measurement modeling template and procedure for measuring the social sustainability performance of an organization: the Social Footprint Method (SFM). We begin with a summary of the functional requirements we identified as a basis for designing the method. We then provide a technical summary of the model (template) and method *as built*, or designed (i.e., in line with the reverse engineering method we employed), followed by a discussion of the important philosophical choices we made in developing it. We conclude with a more detailed explanation of how to perform the method itself.

4.2 UNDERSTANDING THE TASK

On the basis of the discussion contained in Chapter 3, we conclude that no quotients-based tool or method currently exists for measuring and reporting the social sustainability performance of an organization. This is the problem that confronts us. Our primary task, therefore, is to create such a tool. This we will do by applying the same general capital theory approach (CTA; see Section 3.4) found in leading ecological sustainability measurement tools (e.g., the Ecological Footprint Method) to the social domain, albeit with appropriate changes made to reflect the unique circumstances of the social context, in contrast to the ecological one. In addition, the epistemological principles discussed in Chapter 2 must be adhered to.

To perform this task, we will first list a series of functional requirements that arguably overlap with those already addressed by CTA-based ecological sustainability measurement models (e.g., the Ecological Footprint Method), but which also reflect some new requirements germane to the social context. This list will

represent the results of reverse engineering existing ecological tools, as well as the addition of some new functional requirements of our own making.

Next will come the technical design specifications of the Social Footprint Method (and model) itself, which again are the product of reverse engineering existing solutions in the ecological domain, but with changes added of our own design. Here it should be clear that we have essentially reverse engineered (or de-engineered) an existing and analogous solution to the one we are looking for (i.e., sourced from a different context), and that we have then re-engineered a comparable, yet significantly revised, solution of our own in the same general mold. Thus, for the most part, we are modifying an already-existing solution found in a different context, so as to be applicable to the new (social) context in which we ourselves are working. This all but eliminates the need to identify, test, and evaluate competing designs, and instead shifts the focus to adapting an existing design to a new purpose. In that regard, we are not creating wholly new requirements or technical design specifications, but instead are attempting to adhere as closely to possible to existing ones, while making only those changes required to effectively shift from the ecological context to the social one. The next two sections below should be viewed, accordingly.

4.3 FUNCTIONAL REQUIREMENTS

The general purpose of the methodology we have in mind is to quantitatively measure the non-financial, social sustainability performance of an organization, analogous to the manner in which organizations commonly measure financial performance, and also ecological performance (Wackernagel and Rees, 1996). In this regard, we seek to operationalize the social side of the so-called triple bottom line (Elkington, 1998). Out of this general intent come the following functional requirements:

1. The procedure must make it possible to quantitatively measure and report the social sustainability of an organization's operations:
   - The procedure must make this possible for organizations as a whole, as well as for subdivisions within organizations;
   - The procedure must make this possible for physical divisions within organizations, such as for plant sites, branch offices, headquarters locations, etc.;

- The procedure must make this possible for a given time period (e.g., for a year).

2. The procedure must make it possible to measure and report the social sustainability of an organization in terms of the impacts of its activities or operations on anthro capital:
   - This must be done in such a way as to assess the social sustainability of an organization in terms of its own share of what is required to create and/or maintain sufficient levels of anthro capital - sufficient, that is, to help establish or maintain basic levels of human well-being (i.e., it must take background social conditions, or sustainability context, into account);
   - This must be done in such a way as to accommodate competing, if not conflicting, standards for what may constitute basic levels of human well-being (i.e., the procedure should not bias or predetermine in any way the standards used, or preferred, by one user versus another);
   - This must be done in such a way as to make actual, discrete impacts on anthro capital directly measurable against norms or standards for what such impacts ought to be, using consistent units of measurement;
   - This must also be done in such a way as to be able to clearly delineate, and account for, discrete impacts on anthro capital attributable to an organization, as opposed to an organization's upstream suppliers and/or downstream customers;
   - This must be done, therefore, in such a way as to avoid the possibility of double- or multi-counting when viewed from a societal, or whole system, perspective.
3. The procedure should make it possible to compare the social sustainability performance of one organization against another;
4. The procedure should make it possible to measure the social sustainability of an organization's impacts on only one area of impact (AOI), without having to measure the sustainability of its impacts on all other AOIs;
5. The procedure should make it possible to conduct period-to-period (i.e., comparative) performance analyses, while resolving in some way any changes in organizational size, scope, or function that may occur over time;
6. The procedure should be flexible enough in design and construction to be used in conjunction with virtually any leading or locally preferred set of indicators for human well-being;

7. The procedure should include and employ a design specification for a social sustainability measurement model that can be used by any organization, relative to any area of social impact, using whatever indicator(s) for such impact(s) a practitioner wishes to use.

4.4 TECHNICAL DESIGN SPECIFICATIONS

On the basis of the functional requirements set forth above, we now turn our attention to the design of a solution. Because of the nature of the problem we are trying to solve (i.e., how to measure organizational sustainability), the solution we develop must necessarily take the form of a measurement model, as well as a procedure for how to use it. For reasons explained in Chapter 3 (see Section 3.5.1), the measurement model we prefer is a *sustainability* quotient; and the procedure we propose, in turn, is about how to construct, calculate, and interpret such a quotient in specific cases.

Here again, the approach we will take is to jump to a design solution, consisting of a modified (existing) design taken from the ecological domain. In effect, we are starting with a solution manifest in another context (the ecological one), and are modifying it to fit our context (the social one). Much of the design behind our solution, therefore, is pre-existing. The changes and enhancements we will make to it, however, are not. Just as the pre-existing solution is inadequate for use in the social context, so will the design we specify below be inadequate for use in the ecological context.

With the above in mind, the first two specifications summarized below pertain to the procedural side of our solution; the last two pertain to the measurement model. Afterwards, we will go on to explain the method and the quotients it produces in greater detail.

1. The procedure must consist of constructing and calculating *sustainability quotients*, according to which numerators represent actual, discrete impacts on anthro capital, and denominators represent norms or standards for what such impacts ought to be:
   - Units of measurement for numerators and denominators can be of any quantitative form or type of interest to a user, but must directly or indirectly express measures of anthro capital;

- Units of measurement chosen for numerators and denominators must, however, always be consistent within any one quotient.

2. The activity boundaries of an organization, for purposes of an SFM assessment, should be expressed and delineated as follows:
   - The activities encompassed by an SFM assessment should be interpreted as the activities performed by an organization's workers, with the possible inclusion of non-employee workers, if any (see Section 3.2.2);
   - For all workers involved in the scope of an SFM assessment, only the portion of time in their lives they spend performing such organizational work should be factored into the analysis;
   - All other activities performed by the same workers, not related to their organizational roles or identities, should not be included in the scope of SFM assessments, and instead shall, in principle, be accounted for in other sustainability assessments, unrelated to the organization's.
3. The measures contained in the *denominators* of social sustainability quotients should always be:
   - Quantitatively expressed;
   - Expressed either in terms of units of anthro capital in any of its defined forms, or in the form of indicators or proxy measures that correspond to units of anthro capital;
   - Determined by, and reflective of, normative assertions regarding the net number of units of anthro capital (or their indicators or proxies) an organization is or was *expected to contribute* towards helping to create and/or maintain such capital, as may be required to ensure basic levels of human well-being in a defined population, for a defined period of time.
4. The measures reflected in the *numerators* of social sustainability quotients should always be:
   - Quantitatively expressed;
   - Expressed either in terms of units of anthro capital in any of its defined forms, or in the form of indicators or proxy measures that correspond to units of anthro capital;
   - Determined by, and reflective of, descriptive assertions regarding the *net* number of units of anthro capital (or their indicators or proxies) an organization has *actually contributed* towards helping to create and/or maintain such capital, as may be required to ensure basic levels of

human well-being in a defined population, for a defined period of time.

4.5 PHILOSOPHICAL CHOICES

To develop the SFM (including the technical design specifications set forth above), certain key philosophical choices had to be made with respect to:

1. an underlying theory of sustainability,
2. epistemology, and
3. moral philosophy.

Some of these choices, however, are merely preferences of our own, and need not be adhered to in order to successfully use the method (discussed further below, and also in Section 6.3.1.5). Still, it is useful to discuss examples of such choices as a way of illustrating the role that they play in the SFM. The specific choices we made, therefore, and the reasoning behind them are presented below.

4.5.1 Sustainability theory

For the sake of rigor and validity, the SFM should be grounded in the capital theory approach (CTA) to sustainability previously discussed in Section 3.4 above. Under that approach, the sustainability of a thing, or referent, is a function of its impact on one or more forms of capital, each of which is vital in some way to human well-being (see Section 3.4.3.2). The social sustainability of an organization's operations, therefore, is determined by its impacts on certain capitals required to ensure human well-being.

We should choose this orientation to sustainability because it explicitly takes context into account (i.e., it takes impacts on anthro capital and human well-being into account). Other approaches, such as the eco-efficiency perspective or the GRI approach (see Sections 3.3.1 and 3.3.3.2, respectively) are devoid of context, and thereby fail to address sustainability in the plain sense meaning of the term (McDonough and Braungart, 1998). Although they measure impacts on capitals, they never do so with respect to what such impacts ought to be, or in

terms of what their effects on related carrying capacities have been. Not so for the capitals-based approach; hence our preference for it, and the concepts of carrying capacity and human well-being that comes with it.

4.5.2 Epistemology

To measure and report on the sustainability of an organization's operations is to perform an act of knowledge production (i.e., to produce knowledge claims about the sustainability performance of an organization). This immediately calls into question the kinds of claims being made, and the theories of truth, legitimacy, and evaluation that lie behind them. After all, to say that an organization is sustainable, or not, is to make a descriptive claim - which may be true or false. And to say that something ought to be done, or not, is to make a normative claim - which may be legitimate, illegitimate, or non-legitimate. Given the manner in which we have constructed our sustainability quotients as consisting of descriptive numerators and normative denominators, our approach cries out for clarity in terms of what our underlying epistemology is. As supported by the content of Chapter 2, our answer is threefold.

First, the SFM method should be predicated on a realist epistemology - the world is real and exists. Descriptive claims about the world, in turn, can either correspond with the facts or not. This is the correspondence theory of truth and we subscribe to it. Other theories, such as the coherence theory, relativism, and pragmatism simply do not perform as well in a real world, where there can, in our view, be such a thing as correspondence (or not) between statements and facts. If facts are real and statements can describe them, then nothing less than a correspondence theory, or regulative ideal, for truth will do.

Second, we should embrace the all-important distinction between descriptive claims about facts and normative claims about values - in other words, the distinction between the way the world is and the way it ought to be. In so doing, we can also contend that there can be correspondence between value claims and possible facts, not just descriptive claims and actual facts (see Section 2.3.3). Here we should flatly reject relativistic value theories and embrace, instead, another regulative ideal, this time consisting of *the way the world ought to be.* Some possible facts, including actual ones, are simply more fit or desirable than others,

which such assertions can be made in the form of evaluative or normative claims and arguments.

Third is the commitment we should make to fallibilism as opposed to justificationism. Here we can explicitly embrace Karl Popper's epistemology: Critical Rationalism (see Section 2.2.3.3.2). The result is an approach to corporate sustainability management (CSM) that does not require, much less expect, certainty in related measurement and reporting efforts. Thus, the numerators and denominators in our quotients can never be true with certainty, nor should we expect them to be. Instead, they must only have survived our tests and evaluations, while remaining open to falsification. Truth or legitimacy with certainty (i.e., the justificationist position) is simply not possible given the human condition, and given the manner in which our perceptions and understandings of the world are always mediated or filtered by our senses, predispositions, and situational orientations.

4.5.3 Moral responsibility theory

Next is the important role that moral responsibility theory plays in our thinking, if the SFM is to make sense. To the extent that our denominators assert duties or obligations to produce and/or maintain sufficient levels of anthro capital, such duties or obligations must exist. Here we can, and should, embrace one moral philosophy or another, such as those earlier attributed to Kutz, Kant, and Rawls (see Sections 3.6.2.1, 3.6.2.2 and 3.6.2.3, respectively) as foundations for our thinking. While the functioning of the SFM does not in any way depend upon acceptance of those particular philosophies, we ourselves have embraced them as the basis of our own thinking about how the SFM should be applied, as further explained below.

Kutz's explication of complicity theory provides us with a view of organizational action as joint or collective acts, which are committed by groups of individual actors in a participatory fashion. This resolves the difficulty we might have had with the notion of organizations, per se, as putative actors, in which moral duties can inhere. Strictly speaking, organizations cannot be held responsible for anything; only individuals or other agents capable of making choices can. Kutz helps us to understand that organizational action reduces to joint and complicit acts

committed by individuals, and that the moral duties of an organization are really nothing more than the moral duties of the individuals who work for it - and who collectively perform its acts - rolled up, analytically, to the level of the organization.

Kant's influence on our thinking comes specifically in the form of his Categorical Imperative (CI), and the role that it plays in apportioning duties and responsibilities to organizations in the SFM. In effect, we allocate duties and responsibilities to organizations in proportion to the number of individuals who work for them, having philosophically allocated such duties and responsibilities to the same individuals, per Kutz above. Then, when it comes to assessing sustainability in the context of larger populations (e.g., globally), we ask, *What if everyone behaved that way (i.e., the way in which the collective represented by the organization is behaving)? What would the impact on vital capitals be if such behaviors were universalized a la Kant's Categorical Imperative (CI)* (see Section 3.6.2.2)?

This way of applying Kant's CI to assessing the sustainability of human behavior is not without precedent in the sustainability literature. Daly, for example, relies on a test of what would happen if individual or group behaviors were *generalized*, in order to determine their sustainability (1996):

> "[…] an overdeveloped country might be defined as one whose level of per capita resource consumption is such that if generalized to all countries could not be sustained indefinitely; correspondingly an underdeveloped country would be one whose per capita resource consumption is less than what could be sustained indefinitely if all the world consumed at that level" (p. 106).
> …..
>
> "[…] it is unrealistic to think that the standard of per capita resource use of that 5% of the world's population in the United States could ever be generalized to 100% of the world's 5.5 billion people. We must either admit that such development is only for a minority or else redefine development in a way that is generalizable to all" (p. 196).

This procedure for testing the legitimacy of proposed norms is further bolstered by Hare (1963), who argues that *universalizability* is a logical principle, necessary for the avoidance of self-contradiction in the making of moral arguments:

> "If a man is prepared to make positive moral judgements about other people's actions, but not about his own, or if he is prepared to make them about some of his own decisions, but not about others, then we can ask him on what principle he makes the distinction. This is a particular application of the demand for universalizability" (Ibid., p. 102).
> …..
>
> "The point is this: it is part of the meanings of the moral words that we are logically prohibited from making different moral judgements about two cases, when we cannot adduce any difference between the cases which is the ground for the difference in moral judgements. This is one way of stating the requirement of universalizability which, as we have seen, is fundamental to all moral reasoning" (Ibid., p. 216).

Turning next to Rawls, he argues that the allocation of resources in society must be equitable, and also acceptable to the least advantaged, in order to be fair or just. To that end, he advocates for positive and negative duties. Positive duties include the moral responsibility people have to assist others in need, "provided that one can do so without excessive risk of loss to oneself" (Rawls, 1999[1971], p. 98); and negative duties include "the duty not to harm or injure another, and the duty not to cause unnecessary suffering" (Ibid.). These statements, of course, are value claims, and they arguably fit within the broader network of descriptive and normative claims otherwise associated with any specific social sustainability quotient computed by means of the SFM. More importantly, they can provide the moral basis for precisely the kind of normative claims we have in mind for our denominators - for without positive and negative duties in the world, no such claims can be made.

4.6 THE SOCIAL FOOTPRINT METHOD (SFM)

The SFM is the procedure, or method, we propose for measuring and reporting the social sustainability performance of organizations. It takes the form of guide-

lines for constructing social sustainability quotients (i.e., measurement models for expressing the social sustainability performance of an organization). In that regard, it comprises both a design specification for social sustainability quotients (i.e., sustainability measurement models), and a procedure for constructing and interpreting them. In the remainder of this chapter, we present the SFM in terms of:

1. what the detailed guidelines and procedures should be for its use, and
2. what its output should consist of.

4.6.1 The SFM procedure

The SFM is a procedure for measuring and reporting the social sustainability performance of an organization. Since the purpose of the method is to apply a measurement model, the process we propose for doing so is largely tied to the structure and content of the model, and to the need to construct each part of it in a systematic way. In this section, we describe the process we propose, the five steps involved, and the rules and guidelines that should be followed in the performance of each step. The five steps we propose for the SFM are as follows:

- Step 1: Define boundaries of analysis;
- Step 2: Select specific area(s) of impact (AOIs);
- Step 3: Specify and construct denominator;
- Step 4: Specify and construct numerator;
- Step 5: Compute the quotient score.

4.6.1.1 Step 1: Define boundaries of analysis

The first step in the use of the SFM is to determine the boundaries of the organizational entity involved. Organizational boundaries take three forms. The first is a logical or conceptual one, as opposed to a physical or material one. Companies, for example, are often organized into operating units, divisions, and departments. The first boundary question that must be answered, then, is *Which logical or conceptual parts of the organization are to be involved in the sustainability measurement effort?*

The second form of organizational boundary is a physical or material one. Many companies have a presence at more than one physical location, often separating plant or manufacturing facilities, for example, from headquarters, branch, or administrative centers. In such cases, it is important to be clear about *which such physical locations are to be included in a study*, separate and apart from, or subordinate to, decisions already made about the logical units to be included.

The third form of organizational boundary is the temporal one. Since the referent of interest in an SFM project is always activities or operations performed by the logical and physical units selected, the next question is *For what period of time?* In most cases, an organization will choose to assess the sustainability of its operations for a calendar year, often in parallel with its efforts to measure and report its financial performance for the same year. Thus, in such cases, a company will conceivably prepare both an annual financial report and an annual non-financial report for the same year, through which they will attempt to report their overall multi-bottom-line performance.

4.6.1.2 Step 2: Select specific area(s) of impact (AOIs)

Because of the depth and breadth of conditions in society that organizational operations can have impact on, it is very unlikely, we think, that individual sustainability measurement efforts will ever be able to cover them all in any one study or report. It is more likely, therefore, that impacts on only selected conditions will be possible in typical situations, and this, therefore, raises the question of how to specify and select them (i.e., the areas of impact, or AOIs) for any one report, or cycle. The second step in the SFM therefore consists of deciding which AOIs to focus on, having already made the boundary decisions in Step 1.

4.6.1.2.1 Internal versus external areas

The first cut, so to speak, in selecting one or more AOIs for treatment in a measurement effort is the internal/external one. Here we want to make a distinction between social impacts had on the internal workforce of an organization and social impacts had on other stakeholders external to an organization. Turning once

again to the representative impact ontology provided in Appendix B, we see that the associated areas of impact are organized in this way at the top level, and that each of the two main categories of AOIs (internal and external) are further broken down as follows:

1. ***Internal Areas of Investment and/or Impact***
   - *Human Capital* (Direct Contributions to Workers): These are direct contributions to (or impacts had on) *individuals* internal to an organization, which in turn constitute personal human capital resources for its members, workers, or stakeholders.
   - *Social Capital* (Contributions to Social Programs and Resources): These are contributions to (or impacts had on) *programs and institutions* internal to an organization, which in turn constitute, or have impact on, shared social capital resources and services available to its members, workers, or stakeholders.
   - *Constructed Capital* (Direct Contributions Within Own Enterprise): These are contributions to (or impacts had on) the presence or quality of *human-made infrastructures and/or material goods* internal to an organization.
2. ***External Areas of Investment and/or Impact***
   - *Human Capital* (Direct Contributions to Individuals in Society): These are direct contributions to (or impacts had on) *individuals* in society external to an organization, which in turn constitute personal human capital resources for such individuals.
   - *Social Capital* (Contributions to Social Programs and Resources): These are contributions to (or impacts had on) *third-party programs and institutions* in society external to an organization which, in turn, constitute or have impact on social capital resources and services available to individuals and collectives in society.
   - Constructed Capital (Direct Contributions to Social Resources): These are contributions to (or impacts had on) the presence or quality of *human-made infrastructures and/or material goods* in society external to an organization.

It should be clear from the classifications above that we have organized AOIs not only in terms of internal versus external categories, but also in terms of our own definition of anthro capital. In other words, anthro capital can be found both within an organization and outside of it. This, then, constitutes the realm of pos-

sible AOIs that an organization should consider when planning the scope of a social sustainability measurement and reporting effort.

4.6.1.2.2 Criteria for selecting AOIs

Armed with an ontology from which AOIs can be selected for sustainability measurement and reporting, we are still left with the question of how to choose specific ones for further consideration. Here, we do not wish to be prescriptive or prejudicial in any way, insofar as which AOIs should be selected or prioritized for analysis. Practitioners of the SFM should feel free to test and evaluate different approaches for selecting AOIs, as they see fit.

That said, it seems reasonable to suggest that AOIs believed to be most heavily impacted by an organization's operations - be it positively or negatively - should be given preferential treatment, if only to capture the effects of the organization's greatest impacts in a social sustainability report. In positive cases, this can work to the organization's advantage by making it possible for managers to highlight, and take credit for, related outcomes. In negative cases, this can work to the organization's advantage by making it possible for managers to better understand the depth and breadth of the organization's least desirable impacts, thereby supporting the planning process for how to lessen or avoid them.

Here we hasten to add our own view that only AOIs involving legitimate normative duties or obligations should be seen as candidates for analysis. If denominators are to express normative duties or obligations relative to specific AOIs, such duties or obligations must arguably exist. It is here that the concept of a social contract between an organization and its stakeholders could have a particularly valuable role to play (see Section 3.6.2.3), since such a contract would, in principle, actually specify related duties and obligations.

Another very interesting approach for selecting AOIs for consideration in a social sustainability management effort is the *Inside-Out/Outside-In* approach (Porter and Kramer, 2006). Under that approach, AOIs are selected based on perceived opportunities to pursue areas of mutual benefit to both a company and the community, or society, in which it does business. As Porter and Kramer put it, "[t]o advance CSR [corporate social responsibility], we must root it in a broad under-

standing of the interrelationship between a corporation and society while at the same time anchoring it in the strategies and activities of specific companies" (Ibid., p. 83).

This understanding, in turn, they argue, will lead to the identification of linkages between a company and the communities in which it does business. These linkages are of two kinds: inside-out and outside-in. Inside-out linkages involve impacts a company's value chain has "on the communities in which [a] firm operates, creating either positive or negative social consequences" (Ibid., p. 84). Outside-in linkages involve the influence of a company's competitive context, or outside environment, insofar as the company depends on it for business inputs, rules and incentives that govern competition, the size and sophistication of local demand, and the local availability of supporting industries (Ibid.). As the authors put it, "[a]ny and all of these aspects of context can be opportunities for CSR initiatives" (Ibid.). And any and all of them, from our perspective, constitute instances of anthro capital that a company can invest in, in order to create and/or maintain them at required levels.

Porter and Kramer go on to suggest a standard, or test, for choosing from among the many inside-out/outside-in opportunities a company might face, as follows:

> *"Choosing which social issues to address*. No business can solve all of society's problems or bear the cost of doing so. Instead, each company must select issues that intersect with its particular business. Other social agendas are best left to those companies in other industries, NGOs, or government institutions that are better positioned to address them. The essential test that should guide CSR is not whether a cause is worthy, but whether it presents an opportunity to create shared value - that is, a meaningful benefit for society that is also valuable to the business" (Ibid.).
>
> …..
>
> "Corporations are not responsible for all the world's problems, nor do they have the resources to solve them all. Each company can identify the particular set of societal problems that it is best equipped to help resolve and from which it can gain the greatest competitive benefit" (Ibid., p. 92).

Suffice it to say that the Porter/Kramer approach is only one of potentially many alternative philosophies for how to select AOIs for consideration in corporate social sustainability programs. This, we think, constitutes an area for future research in the application and continued development of the SFM, and is not, therefore, a question or problem we intend to solve here and now. Instead, let us simply agree that one or more AOIs from an extensive list of possibilities must be selected as Step 2 of the SFM, and practitioners of the method should feel free to test and evaluate their own ideas for how best to do so.

4.6.1.3 Step 3: Specify and construct denominator

Once one or more AOIs have been selected, it is time to start building the corresponding quotients, one at a time. Each AOI must have its own dedicated quotient. Later on, we will discuss the possibility of combining quotient scores, but for now let us confine ourselves to the task of building single quotients for each AOI.

4.6.1.3.1 Standards of performance

The first step in building a quotient (i.e., Step 3 in the SFM) is to specify the denominator. This is arguably the most important and challenging step in the process because it establishes the standard against which actual organizational behavior will be judged as sustainable or not. Indeed, the denominator in a sustainability quotient is intended to represent an organization's own share of contributions, or normative impacts, required to create and/or maintain sufficient levels of anthro capital in the world.

For example, the denominator might consist of an organization's share of human, social, and constructed capital required to deliver primary education to a community; or basic healthcare services; or basic nutrition; or transportation; or national security; etc. Here again, it may be helpful to refer back to the representative ontology of AOIs provided in Appendix B, this time to point out that every one of the AOIs listed in that section has, in theory, a corresponding, minimally suffi-

cient supply of anthro capital associated with it, that must be maintained in order for human well-being to obtain.

4.6.1.3.2 Causal theories

In order to formulate claims about either the descriptive or normative impacts of an organization on human well-being in the world (i.e., on specific areas of impact, or AOIs), sustainability managers in organizations must have causal theories about how such impacts occur, and what the role of organizations is, or might be, in related chains of events. It is very important, therefore, that for every sustainability quotient an organization sets out to build, a corresponding causal theory be identified (i.e., selected or developed) as a basis for the claims to be made in the quotient's numerator and denominator. It is in this way that actual and normative impacts reflected in the numerators and denominators of sustainability quotients, respectively, can be tied to human well-being in meaningful ways. In the end, it is the strength of a causal theory that will determine the force and persuasiveness of claims made in sustainability quotients. Users of the SFM should orient themselves, accordingly.

Causal theories are important to the SFM not only because of the logic they provide in helping us to link causes and effects, but also because they are the sources of the metrics and indicators we need to construct our quotients. Indeed, once we have established a causal theory for a particular AOI, we can differentiate between causal variables and effects within it, and the indicators that can be used for each. In order to change the state of a system, then, interventions can be made in such a way as to change the states of causal variables or conditions. If a causal theory is correct, and an intervention has been properly made with respect to a particular causal variable and a corresponding effect, the state of a system can be willfully changed, and the indicators associated with a theory can be used to measure the outcomes. In the case of the SFM, this will generally take the form of enhancing one or more types of anthro capital in order to create the conditions required to achieve desired outcomes.

To explore this idea further, let us consider some examples of AOIs that might be featured in sustainability quotients by taking a look, once again, at the UN's

Millennium Development Goals (MDGs). At the top level, there are eight such Goals:

1. Eradicate extreme poverty;
2. Achieve universal primary education;
3. Promote gender equality and empower women;
4. Reduce child mortality;
5. Improve maternal health;
6. Combat HIV/AIDS, malaria, and other diseases;
7. Ensure environmental sustainability;
8. Develop a global partnership for development.

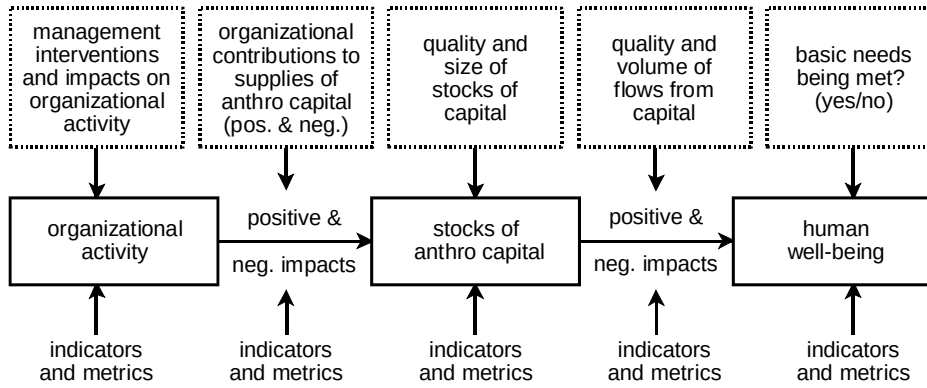
Each of the MDGs corresponds to one or more possible AOIs, and is clearly expressed in terms of ensuring human well-being. Still, each MDG, as stated, is too broad and devoid of metrics to serve as a basis for our denominators. As it turns out, however, the MDGs have been further defined by the UN in the form of sixteen specific "targets". Each of these targets, along with their corresponding MDGs and indicators, is listed below:

1. Halve, between 1990 and 2015, the proportion of people whose income is less than a dollar a day (*Corresponding MDG*: 1; *Indicator:* Proportion of people living on less than $1 a day, expressed as a percentage);
2. Halve, between 1990 and 2015, the proportion of people who suffer from hunger (*Corresponding MDG:* 1; *Indicator:* Proportion of children under age five who are underweight, expressed as a percentage);
3. Ensure that, by 2015, children everywhere, boys and girls alike, will be able to complete a full course of primary schooling (*Corresponding MDG:* 2; *Indicator:* Total net enrollment ratio in primary education, expressed as a percentage);
4. Eliminate gender disparity in primary and secondary education preferably by 2005 and in all levels of education no later than 2015 (*Corresponding MDG:* 3; *Indicator:* Employees in non-agricultural wage employment who are women, expressed as a percentage);
5. Reduce by two thirds, between 1990 and 2015, the under-five mortality rate (*Corresponding MDG:* 4; *Indicator:* Under-five mortality rate per 1,000 live births, expressed as proportion of deliveries attended by skilled healthcare personnel);
6. Reduce by three quarters, between 1990 and 2015, the maternal mortality ratio (*Corresponding MDG:* 5; *Indicator:* Proportion of deliveries attended by skilled healthcare personnel, expressed as a percentage);

7. Have halted and begun to reverse the spread of HIV/AIDS (*Corresponding MDG:* 6; *Indicator:* HIV prevalence in adults aged 15-49 in sub-Saharan Africa and all developing regions, expressed as a percentage; and number of AIDS deaths in sub-Saharan Africa, expressed in millions);
8. Have halted by 2015 and begun to reverse the incidence of malaria and other major diseases (*Corresponding MDG: 6*; *Indicator:* Proportion of children sleeping under insecticide-treated bed nets in selected countries, expressed as a percentage);
9. Integrate the principles of sustainable development into country policies and programmes and reverse the loss of environmental resources (*Corresponding MDG:* 7; *Indicator:* Proportion of land area covered by forests, expressed as a percentage);
10. Halve, by 2015, the proportion of the population without sustainable access to safe drinking water and basic sanitation (*Corresponding MDG:* 7; *Indicator:* Proportion of the population using improved sanitation, expressed as a percentage);
11. Improve the lives of at least 100 million slum dwellers by 2020 (*Corresponding MDG:* 7; *Indicator:* Urban population living in slum conditions, expressed as a percentage);
12. Address the special needs of the least developed countries, landlocked countries and small island developing states (*Corresponding MDG:* 8; *Indicator:* Official development assistance from developed countries as a proportion of donors' gross national income, expressed as a percentage);
13. Develop further an open, rule-based, predictable, non-discriminatory trading and financial system (*Corresponding MDG:* 8; *Indicator:* Proportion of imports from developing countries (excluding arms and oil) admitted to developed countries duty-free, expressed as a percentage);
14. Deal comprehensively with developing countries' debts (*Corresponding MDG:* 8; *Indicator:* External debt service payments as proportion of export revenues, expressed as a percentage);
15. In cooperation with developing countries, develop and implement strategies for decent and productive work for youth (*Corresponding MDG:* 8; *Indicator:* Youth employment rates, expressed as a percentage);
16. In cooperation with the private sector, make available the benefits of new technologies, especially information and communications (*Corresponding MDG:* 8; *Indicator:* Number of telephone subscriptions and Internet connections per 100 population, expressed as a percentage).

The fact that indicators, or metrics, exist for each of the sixteen targets associated with the MDGs means that, in principle, progress towards achieving the goals expressed by the MDGs can be quantitatively measured. Indeed, the UN continually measures global progress towards achieving the MDGs in precisely that way, including in their latest progress report (UNDP, 2007). Still, the indicators listed are effect indicators, not cause indicators. They correspond to outcomes in human well-being, while leaving open the question of how to improve upon them by having impact on upstream variables, or causes.

Figure 4.1 Indicators and metrics mapped to causal theory of human well-being



Thus, in order to identify the causal variables (and related indicators) to be used as a basis for constructing sustainability quotients, causal theories must be established in which the causes and effects of human well-being, and the chain that ties them together, are explained (see Figure 4.1). Causal variables in the theory must then be correlated with measurable indicators (or proxies) and metrics, at which point an organization's normative impacts on anthro capital can finally be specified in the denominator of a quotient. This same process applies to the numerator as well, but that comes later in Step 5.

What we have said here leads to a possible course of action in Step 3 of the SFM as follows. Having selected an AOI in Step 2 (e.g., an AOI represented by an MDG target), research and/or development must take place in order to determine the associated, present-day conditions in society, and whether or not human well-being is at desired levels. Assuming conditions are deficient, the indicators used to measure and express them must be tied to a causal theory, which, in turn, must

be made explicit or developed as such. Once that is done, related causal conditions, or variables, can be identified or conjectured, the make-up of which can then be expressed in terms of anthro capital.

Indeed, it is our contention that the causal conditions in society required to ensure human well-being will always be expressible in terms of anthro capital (see Sections 3.4.3.1 and 3.4.3.2). Thus, in order to improve or maintain some human or social state of affairs as reflected by one or more *effect indicators,* the corresponding state of one or more forms of anthro capital - which are taken to be sources of goods and services required for human well-being - must be deliberately impacted (e.g., by an organization) in some way. It is the underlying causal theory that determines which, and to what extent, such forms of anthro capital must be produced and/or maintained - and *how* - in order to obtain the desired results in the state of a system, or AOI.

All of this suggests that the indicator metrics set forth above in connection with the sixteen MDG targets should be viewed not as potential metrics for use in social sustainability quotients, but as downstream *effect indicators* of upstream causes. Given sufficient faith in the quality and fidelity of such *effect indicators,* an effort can be made via the formulation of a causal theory to trace their precipitants to specific (causal) variables in the system (i.e., to organizational behaviors which have impact on stocks of anthro capital). That, then, must happen before either the numerator or denominator of a sustainability quotient can be specified, the key to which is having a good causal theory in hand.

4.6.1.3.3 Indicators, proxies, and metrics

In order to assess the sustainability performance of an organization relative to impacts on some AOI, descriptive data or indicators for the AOI must either already exist or be created, preferably in connection with a causal theory as discussed above. Once found or created, such data can then be used to specify a minimum level of sufficiency for related conditions in society (i.e., in order to ensure human well-being), and also to determine whether or not such conditions exist. An organization’s proportionate share of such a quantity (discussed further below) can then be formulated for positioning in the denominator of a sustainability quotient.

As earlier noted, it is our contention that all progress towards achieving the MDGs, and any other standard of social well-being, necessarily takes the form of creating and/or maintaining anthro capital at certain levels. This, of course, is often facilitated by the allocation of financial capital, or money, but such funds are almost always used to create and/or maintain anthro capital, and in that regard can be viewed as merely proxies for anthro capital itself. In fact, while it is true that the UN itself specifies investments required to achieve the MDGs in monetary terms, all such funds are clearly aimed at creating and/or maintaining anthro capital resources of one kind or another. Consider the following statement in the recent UN progress report cited above (Ibid., p. 5):

> "As of mid-2007, 41 countries in sub-Saharan Africa had started the process of preparing national development strategies aligned with the MDGs and other development goals agreed upon through the United Nations. During this mid-point year, the international community needs to support the preparation of these strategies and to accelerate the implementation of the MDGs.
>
> In general, strategies should adopt a wide-ranging approach that seeks to achieve pro-poor economic growth, including through the creation of a large number of additional opportunities for decent work. This, in turn, will require comprehensive programmes for human development, particularly in education and health, as well as building productive capacity and improved physical infrastructure. In each case, an effort should be made to quantify the resources required to implement these programmes."

Again, it is our contention that all such 'resources' and 'programmes' reduce to combinations of human, social, and constructed capital, as the quotation above suggests (see Section 3.4.3.1 for our definition of these terms). Thus, contributions towards achieving the MDGs can be measured in terms of whether or not the resources required to fully implement related strategies and programs have been provided and maintained, in accordance with the standards of performance specified in the MDG program itself. If, for example, 300 new, fully staffed primary schools must be built in sub-Saharan Africa by 2015 in order to meet MDG #2, then one measure of performance against that goal, or standard, would be to determine whether or not the related human, social, and constructed capital needed to build and staff the schools by that date is being provided. Moreover, if

that is the standard of well-being we have set for ourselves, then meeting or exceeding that standard is, by definition, sustainable, whereas falling short of it is not.

In principle, then, specifying the denominator in a sustainability quotient is an attempt to allocate a proportionate *burden share* of anthro capital to a specific organization, based on some standard of performance associated with achieving and/or maintaining human well-being. Thus, in keeping with the example above, if we were building a quotient to assess a company's contributions towards achieving MDG #2 in sub-Saharan Africa, we would need to determine what portion of the burden to build the 300 schools should be allocated to the particular organization under study. This assumes the causal theory step above has been completed. The next step, then, would be to determine what metrics, or units of measurement, should be used to express the related values. Here there are basically two choices.

The first would be to use actual units, or related indicators, of anthro capital, per se, such as X quantity of human capital, Y quantity of social capital, or Z quantity of constructed capital. In that case, an organization could simply show how much of each type of capital it had, in fact, contributed (positively or negatively) during the period of time covered by an assessment. The other way to do this would be to use monetary units as a proxy for actual anthro capital contributions. The UN, for example, expresses required inputs for all of its MDG programs in monetary terms, and that, in the end, is how its programs are in fact made possible (i.e., donor countries make monetary contributions to the UN, which are then used to create and maintain the anthro capital required to accomplish its goals). Individual companies, too, can make such monetary contributions, as the UN actively encourages them to do (Nelson and Prescott, 2003).

Proxies for anthro capital can take non-monetary forms, as well. In Chapter 5, for example, we highlight a case where units of *natural* capital were used as surrogates for *anthro* capital. In that particular case (Ben & Jerry's), certain levels of anthro capital were defined as being needed in order to effectively combat global warming. Instead of directly measuring impacts on anthro capital by the company to address that goal, however, we chose to interpret reductions made in the company's CO_2 emissions as a proxy for investments made in all three types of capital (human, social, and constructed). Why? Because all such contributions would have gone towards lowering CO_2 emissions anyway - exclusively so. *Indeed, all*

of the progress made in lowering the company's CO_2 emissions was arguably preceded by investments of that kind, at whatever levels were required to make the reductions possible. Thus, in that case, the reductions realized served as a reliable indicator of, or proxy for, contributions made in building and/or maintaining anthro capital in the particular AOI of interest to us (according to the causal theory we used).

Here it should be clear that just because units of natural capital are used in a quotient (i.e., the capacity of the atmosphere to serve as a sink for CO_2 emissions) that, by itself, does not make a quotient an ecological quotient as opposed to a societal one. If ecological units of natural capital are being used as a proxy for anthro capital, then the ecological nature of the proxy is of no consequence. This would be true for any other proxy, including monetary ones as well. The fact that a measure of contributions made towards helping the UN to achieve its MDGs is expressed in monetary terms does not make the resulting quotient a measure of financial performance. Proxies are proxies; they are surrogates, and by definition stand for other things. All we are stipulating, then, is that when proxies are used in the SFM, they must stand for anthro capital. As long as that condition is met, proxies can be anything.

4.6.1.3.4 Responsible populations and people feet

In the section above, we used the term *burden* shares to refer to the degree to which an organization can be held responsible for contributing its proportionate share of anthro capital in order to ensure human well-being. So far, we have discussed the logic, indicators, proxies, and metrics for such contributions, but we have not yet explained how to calculate and assign, or allocate, them to specific companies. That is our next task.

There are two ways to calculate burden shares. The first way applies when the population responsible for the AOI under study is only the workers of the organization being assessed, or some subset thereof; the second way applies when the responsible population is broader than that (i.e., when it includes not only the workers in an organization, but members of the outside world, as well). The key issue, or variable, here is the *responsible population* for the AOI under study, and

whether or not it is society at large, including a company's workers, or instead is confined to only the workers of a company, itself.

As already noted, the SFM allocates responsibility for creating and/or maintaining anthro capital to individuals, not organizations. Organizations, in turn, acquire their duties and moral responsibilities from the people who work for them. In this regard, organizations are merely collectives of individuals who engage in joint acts, and it is the joint responsibilities of individuals in organizations, therefore, that underlies and gives meaning to the notion of organizational responsibility (see Section 3.6.2.1).

For purposes of a particular sustainability analysis, then, an organization is either part of a broader human population responsible for creating and/or maintaining anthro capital, or it is the total such population. Assessing the quality of *Work/-Family Balance* as an aspect of employment at a particular company, for example, will typically involve standards of performance that apply only to the organization itself. Thus, members of the outside world bear no part of the burden associated with that particular AOI, and should not be considered or reflected in the assessment of related performance, or in the denominator of a quotient, therefore, in any way.

An organization's impacts on helping to achieve the MDGs, however, presents a very different situation. For those AOIs, it is the entire world population that is arguably responsible, for it is a global obligation, not just an organizational one, to create and maintain the anthro capital required to solve the attendant problems. In cases like that, therefore, where the total responsible population for an AOI includes, but is not limited to, an organization's own workforce, the burden share of an organization must be computed in terms of how its size compares to the background (e.g., global) population. In other words, we must determine what proportion of the total responsible population an organization represents, so that we can assign it a corresponding share of the burden for creating and/or maintaining required levels of anthro capital. To do this, we use a metric we call People Feet (PF).

A People Foot calculation is a way of adjusting, or normalizing, the headcount size of an organization. A People Foot, as such, is a metric that represents a full 24-hour day in the life of a single person (i.e., it is a person-day). An organization with 1000 full-time employees, for example, would not have 1000 People

Feet. Instead, it would only have approximately 240 People Feet, since most full-time employees spend only 24% of their total time at work versus other parts of their lives. The People Foot metric, therefore, is a way of allocating burden shares to organizations based on how much time people employed by an organization actually spend at work, in the aggregate. The social and environmental impacts of human activities can thereby be tied to specific activities, and the same goes for burden shares. And since the SFM is activity-centric in terms of its referents, the PF metric is very important to us.

Let us consider a very simple, fictitious example of how a People Foot calculation might be used to specify a denominator in a social sustainability quotient. Imagine a world in which there are 10,000 people and a United Nations program of MDGs, including one MDG consisting of a need to build 100 new primary schools at $10,000 each in a given year. Assuming everyone in this imaginary world had an equal responsibility for achieving the MDGs, the per capita cost of building the 100 new schools would be $100.

Now let us assume that 1,000 of the 10,000 inhabitants in the world work for a single company called Acme Widgets. And let us assume that we are at Step 3 of the SFM, and that we are attempting to construct a sustainability quotient for Acme, insofar as its impacts on the primary school MDG is concerned. Because the AOI involved (i.e., achieving the MDG) has a responsible population that includes, but is not limited to, the workers of the organization itself, a People Foot calculation would need to be made for Acme Widgets in order to specify the denominator.

In this case, the total responsible population is 10,000 people - the total population of the world. Acme's headcount, however, is only 1,000 people, and all of its workers spend only 24% of their total time at work. Thus, Acme has a total of 240 People Feet. At $100 per People Foot (or person), Acme's total burden share of what it will take to achieve the primary school MDG is $24,000. That, then, would be the specification of its denominator in this particular case.

Note that in this example, we used a monetary proxy to represent the extent of anthro capital that would have to be contributed or created by Acme in order to meet its burden share of the MDG. Another way of specifying the denominator could have been to compute Acme's portion of the actual human, social, and constructed capital required to build and operate the 100 schools, and then express

its burden share in those terms. In this case, however, we opted to use a monetary proxy, because it was easier and more practical to do so.

Turning back to the case where the responsible population for an AOI is limited to the organization itself, there is no need to calculate People Feet or burden shares, because the organization comprises the entire responsible population, and not just part of it. In such cases, the organization is wholly responsible for creating and/or maintaining the anthro capital involved, and its employees, in turn, constitute 100% of the same responsible population, regardless of how much time they spend at work. Thus, its denominators should be specified accordingly (i.e., as being reflective of the entire burden share for an AOI, and not just part of it). The analytical perspective thereby shifts from a per capita one to an enterprise-wide one. Put differently, the per capita scores, or quotients, in such cases, and the enterprise-wide scores, or quotients, in the same cases would always be the same, hence the irrelevance of People Foot calculations.

Examples of cases in which the responsible population for an AOI consists of only the organization itself, and no more, might include *internal transparency and openness*, *personal and organizational learning*, *workforce diversity*, *livable wages*, *business ethics*, *work/family balance*, and other AOIs that involve conditions in the workplace. In such cases, there is no need to calculate the proportion of a wider population represented by a workforce (i.e., the organization's People Feet), because the responsible population for the AOIs involved is confined to the organization itself.

4.6.1.3.5 Binary performance scales

Once an AOI has been selected for analysis, and after the denominator has been developed, a performance scale for plotting the resulting quotient calculation, or score, must be defined. As earlier discussed in Chapter 3, the SFM is predicated on a binary theory of sustainability (see Section 3.5.3.1, and also Figure 3.2). Depending on the type of sustainability quotient one is working with, and especially the nature of the normative standard specified in the denominator, the specific performance scale that should be used will vary. In general, there are two types of scales, each of which is just a variant of the same binary theme. We discuss them each below.

4.6.1.3.5.1 A convention for ecological scores

The first variant of the binary sustainability performance scale is the one used for ecological quotients. An ecological quotient is one in which the denominator expresses a normative impact on natural capital, either directly in terms of units of natural capital or in the form of a proxy. Because natural capital is limited and non-anthropogenic, the norms expressed in ecological quotients always take the form of not-to-exceed propositions. That is, they specify quantities of natural capital that organizations, for example, are entitled to have or use, but which they must not exceed.

Because of the not-to-exceed form of normative propositions in the denominators of ecological quotients, quotient scores that exceed 1.0 in such cases should be interpreted as being indicative of unsustainable activities or operations. Quotient scores of less than or equal to 1.0 ($\leq$1.0), by contrast, should be regarded as sustainable. The latter is true because such scores indicate that an organization is either falling below its proportionate share of capital (natural capital, in this case), or at worst is no more than matching it. Scores of greater than 1.0 (>1.0), in turn, indicate that an organization is either exceeding its proportionate share of the flows of capital, diminishing underlying capital stocks, or both.

It may also be the case that when units of natural capital are being used as proxies for impacts on anthro capital, the scoring convention described in this section should be used. This, in fact, is how we approached the measurement of sustainability performance in the Ben & Jerry's case we present in Chapter 5 below.

4.6.1.3.5.2 A convention for social scores

In the case of social sustainability quotients, the logic of things reverses. This is because anthro capital is not limited and is, as opposed to *is not*, anthropogenic. The denominators of social sustainability quotients are therefore not expressed in terms of not-to-exceed propositions; rather, they are expressed in the form of *not-to-fall-below* statements. To be socially sustainable relative to some AOI, an organization's impacts on the AOI must be such that it helps to create and/or maintain related levels of anthro capital, sufficient in size to ensure some basic level of human well-being. Its net contributions, therefore, should not fall below

its proportionate share of what it will take to create and/or maintain sufficient levels of anthro capital. It should meet or exceed such expectations.

Because of the not-to-fall-below form of normative propositions in the denominators of societal quotients, quotient scores that fall below 1.0 in such cases should be interpreted as being indicative of unsustainable activities or operations. Quotient scores of greater than or equal to 1.0 (≥ 1.0), by contrast, should be regarded as sustainable. The latter is true because such scores indicate that an organization is meeting or exceeding its proportionate burden share of producing and/or maintaining capital (anthro capital, in this case). Scores of less than 1.0 (<1.0), by contrast, indicate that an organization is falling below its proportionate burden share, and is thereby either free-riding on other parties' contributions, failing to build or maintain capital stocks at normative levels, or both.

4.6.1.3.6 The epistemology of denominators

As we have said, the denominator in a sustainability quotient should reflect a normative proposition, or assertion, as to what an organization's impacts on anthro capital ought to be. Bound up in this proposition are at least three subsidiary claims:

1. that individuals can, or ought to, be held responsible for ensuring human well-being,
2. that organizations ought to be viewed as human collectives, with moral responsibilities grounded in the moral obligations of their workers - which such obligations also arise from, and apply to, their joint acts - and
3. that the burden shares reflected in denominators ought to be allocated in the ways we have suggested.

It should also be clear, we hope, that any claim put forward as a basis for the specification of a denominator in a sustainability quotient must fundamentally assert a standard of performance for achieving and/or maintaining human well-being in the AOI of interest, proportionately allocated to the organizational level of analysis. This is the sine qua non of a denominator, which can therefore serve as both a guide and a test for whether or not a proposed denominator is sufficient for purposes of the SFM. If a proposed denominator asserts a standard of performance for an organization - and for a particular AOI - which, if achieved

either by the organization itself (for internal AOIs), or universally (for external AOIs) would result in the creation and/or maintenance of anthro capital sufficient for the satisfaction of human well-being at some basic, normative level, then the specification of the denominator will have been properly made. Beyond that, it is up to the builder of the quotient to make the related arguments and to show that the denominator selected has, in fact, adequately survived *knowledge claim evaluation* (see Section 2.2.3.3.).

4.6.1.3.7 Summary of Step 3

Given the complexity of Step 3, it may be helpful to briefly summarize it in a more granular way in the form of Substeps, as follows:

- *Substep 3.1:* Establish a causal theory for the AOI selected in Step 2, and distinguish between cause and effect indicators (or variables) within it, insofar as organizational effects on stocks and flows of anthro capital and human well-being are concerned;
- *Substep 3.2:* Determine types of anthro capital to be quantified as the basis of denominator (and numerator) values;
- *Substep 3.3:* Research, select, and/or develop the metrics required to quantitatively express the denominator (and numerator) for the AOI selected in Step 2, and for the anthro capital components identified in Substep 3.2;
- *Substep 3.4:* If a proxy unit of measurement is to be used for the denominator, verify that it stands for contributions that would otherwise take the form of actual units or indicators of anthro capital;
- *Substep 3.5:* Determine whether or not the responsibility for impacts on the AOI selected in Step 2 rests solely with the organization under study, or instead encompasses a broader human population. If the latter, it may be necessary to calculate the size of the organization in terms of our *People Foot* metric, especially when computing Social Footprints for the organization as a whole; if the former, plan to allocate the AOI's entire burden share to the organization in the denominator;
- *Substep 3.6:* Form competing knowledge claims as to what the organization's proportionate burden share should be in order to create and/or maintain sufficient levels of anthro capital (i.e., as required to ensure hu-

man well-being in the AOI of interest) - select knowledge claim that best survives testing and evaluation through knowledge claim evaluation;
- *Substep 3.7:* Populate the denominator with a quantitative value in accordance with decisions reached in Substeps 3.1 - 3.6;
- *Substep 3.8:* Determine which of the two types of binary performance scales should be used for plotting and interpreting the results of the quotient calculation. This will logically follow from the nature of the denominator chosen for use in the analysis (e.g., indicators versus proxies).

In all cases, the resulting denominator must comprise a normative assertion regarding the organization's duty or obligation to have impact on anthro capital in some way, and in some proportion for a particular AOI, in order to ensure human well-being. To test the form and content of a denominator, one can ask the following questions:

1. Does the denominator assert an organization's legitimate and proportionate duty or obligation to have impact on anthro capital at some quantitative level, in order to ensure human well-being? And
2. If the normative impacts are expressed in terms of proxy units of measurement, do the units correspond to actual units of anthro capital?

Assuming that Substeps 3.1 - 3.8 above have been followed, and that the answers to the two validating questions above are affirmative, the denominator of the sustainability quotient will have been properly specified.

4.6.1.4 Step 4: Specify and construct numerator

The fourth step in the SFM is to measure an organization's actual impacts on the anthro capital associated with the particular AOI under study, and to then populate the numerator of the sustainability quotient involved with the resulting data. Here, the claim made in the numerator of the quotient is a descriptive one, whereas, again, the claim made in the denominator is a normative one. In other words, the claim made in the denominator is about what the organization's impact on anthro capital ought to be, and the claim made in the numerator is about what the organization's impact on anthro capital has actually been - relative to the same AOI, of course. In this regard, we can say that sustainability assessments reduce to quotients of *is* statements over *ought* statements.

Here, by reference, we also include all of the guidelines for using proxy units of measurement earlier discussed for denominators in Step 3, since the same guidelines also apply to the specification and expression of numerators. It is also important to state that once units of measurement have been chosen for denominators, the same units must be used for numerators of the same quotients; and the same AOI scope, of course, must also be adhered to. In other words, when a normative assertion is made with respect to a particular AOI in the denominator using a particular unit of measurement, the same AOI scope and conditions must be referred to by the numerator, using the same units of measurement.

Also included here, by reference, is the entire discussion set forth above in Section 4.6.1.3.2 regarding the role and importance of causal theories to the construction of sustainability quotients. Just as a causal theory is a necessary precondition for the specification of denominators, it is also a necessary precondition for the specification of numerators. This is because in both cases reference must be made to the same understanding of how sufficiency in anthro capital for the AOI under study can be achieved, and what the related social cause and effect dynamics are presumed to be. Thus, the same causal theory will help to identify the causal variables that must be referenced normatively in the denominator and descriptively in the numerator.

Last, we also include here, by reference, all of the epistemological guidelines set forth above in Section 4.6.1.3.6 (The epistemology of denominators). Here in Step 4, the only difference is that instead of making normative assertions about what organizational performance ought to be (as we did in Step 3), we are making descriptive assertions about what organizational performance has actually been. The *knowledge production* process is otherwise identical between the two steps.

4.6.1.5 Step 5: Compute the quotient score

The final step in the SFM is to compute the quotient score; plot it on the binary sustainability performance scale defined in Step 3; and interpret the result. Computing the score, of course, is a simple matter of dividing the numerator by the denominator. The resulting score will either be greater than 1.0, less than 1.0, or equal to 1.0. As earlier explained, in most cases where societal quotients are con-

cerned, the interpretation of results will be such that scores of greater than or equal to 1.0 (≥ 1.0) will be indicative of sustainable performance, and scores of less than 1.0 (<1.0) will be indicative of unsustainable performance. Quotient scores can be interpreted accordingly, and the results, in turn, can feed back into management decisions about how to manage organizational operations in order to raise, lower, or maintain scores, as appropriate.

4.6.2 Guidelines for reporting

Throughout this thesis, we have frequently paired the concepts of sustainability measurement and sustainability reporting. The two tend to go hand in hand. Here we wish to acknowledge that reporting can take place at many different levels of analysis, for many different audiences or stakeholders, and for many different purposes. Some further discussion of how the results of SFM assessments can be formatted and applied is therefore warranted.

4.6.2.1 Audience and application

The general or most typical case we envision for when and how SFM reports will be used is as a means of satisfying various stakeholders' needs to know whether or not the operations of an organization are socially sustainable. Such stakeholders may include owners, employees, community members, trading partners, customers, regulators, and others. In addition, the same reports will be needed by corporate sustainability managers as input to their own efforts to organize and manage the operations of an organization, in such a way as to cause its operations to be sustainable. When such managers implement sustainability strategies or make related program interventions of one kind or another, they need a means of determining what the effects of their actions have been, and social sustainability reporting is one way of doing so. Sustainability measurement and reporting, then, must be a persistent and cyclical process that provides sustainability managers, and others, with information about the ongoing social sustainability performance of their organizations.

4.6.2.2 Per capita versus cumulative calculations

The SFM provides for two basic kinds of performance reporting: per capita reporting and collective reporting. Per capita reporting is reporting at the level of the People Foot metric described above, and collective reporting is reporting at the level of an entire enterprise, or at some other lower sub-organization or group level.

4.6.2.2.1 As determined by AOIs

Here it should be clear that per capita (or per People Foot, or PF) reporting is only appropriate in cases where the PF metric has been used. Once again, the PF is used in cases where the responsible population for an AOI under study includes, but is not limited to, an organization's own workforce, such as in cases where the achievement of global goals, like the MDGs, are involved.

Thus, in cases where an AOI choice drives a decision to express denominators in Step 3 in terms of PF metrics, reporting, too, should be expressed in PF terms, so as to be able to compare the actual per PF (i.e., per capita) performance of the organization to the normative per PF (i.e., per capita) standard. In most such cases, it will also be of interest to measure and report the performance of an organization at an enterprise-wide level of analysis, and to compare the collective performance with the per PF performance. This, in fact, is what we did for one of the two case studies highlighted in Chapter 5 (Ben & Jerry's).

4.6.2.2.2 As determined by organizational change

Another reason to express results on a per capita, or per PF, basis, is to be able to counter the distortional effects of natural changes in the size of an organization, or in the scope of its activities over time. If an organization doubles in size from one year to the next, for example, its impacts on anthro capital at an organizational level of analysis - both descriptively and normatively - will obviously change, accordingly. In order to avoid the statistical inconsistencies that such changes can cause in measurement and reporting, a per capita metric can be used.

A per capita metric, of course, is a way of gauging the performance of an organization independent of its size or scope of activity, by referring to a common denominator. The People Foot metric is simply a per capita metric adapted to our purposes.

4.6.2.3 General formatting and content

SFM reports will generally take the form of spreadsheets and related tabular, statistical, and graphical reports. Each such set of reports is liable to vary in accordance with the properties and requirements associated with individual AOIs. In general, however, data contained in an SFM report will fall into four sections, each of which is reported for one or more years. The four sections are as follows:

1. *Pertinent Organizational Data:* Includes the calculation of People Foot size for each period of analysis, in cases where the People Foot metric is required; other organizational data, if needed, is included here as well, for use in making calculations in the remaining sections;
2. *Denominator:* A section in which the denominator, or norm or burden share, for an organization is calculated for each period of analysis;
3. *Numerator:* A section in which the numerator, or norm of actual impacts on anthro capital by an organization, is calculated for each period of analysis;
4. *Per Capita and Collective Scores:* A section in which the per capita and collective quotient scores, derived from the data contained in the sections above, are computed and presented for each period of analysis.

Each of the SFM illustrations contained in Chapter 5 adheres to this reporting convention. All other reporting guidelines and discussion contained therein is included, by reference, in this section.

4.6.3 Validity

4.6.3.1 Introduction

This thesis is fundamentally about the development of a measurement model and method for assessing the social sustainability performance of organizations. As such, it has a *construct* as its primary focus (the social sustainability of an organization), and its purpose is to offer a solution for how to measure it (the construct). Validity issues therefore necessarily come into play, at least in terms of whether or not the proposed solution can be relied upon to do what it is supposed to do (i.e., accurately measure the social sustainability performance of organizations).

Before we take up the issue of validity in more detail, one other preliminary remark is needed. In this thesis, our operationalization of the construct of interest to us has stopped short of the development of instrumentation, per se. Instead, we have done two things:

1. we have developed a design specification for a measurement model, or instrument, that can be used as a basis for creating one or more actual such instruments for use in measuring the social sustainability performance of organizations, and
2. we have developed a general procedure that can be followed when applying such instruments.

The fact that we have not developed any actual instruments in this thesis has implications in terms of the relevance of certain kinds of validity tests, as further discussed below, even as it also implies where this research ought to go in the future, as later discussed in Chapter 6.

4.6.3.2 Types of validity

Given the nature of the work performed in this thesis, we identified three types of validity as potentially germane to our results: content validity, construct validity, and face validity. Our conclusions regarding the applicability of each of these alternatives to our thesis are discussed separately below.

4.6.3.2.1 Content validity

Content validity refers to "the extent to which an empirical measurement reflects a specific domain of content. For example, a test in arithmetical operations would not be content valid if the test problems focused only on addition, thus neglecting subtraction, multiplication, and division" (Carmines and Zeller, 1994, p. 13). As Carmines and Zeller further point out, in order to establish content validity, "the researcher must be able to specify the full domain of content that is relevant to the particular measurement situation" (Ibid.).

While it is true that this thesis does not result in the development of any actual instruments, it:

- does provide a design specification for instruments, and
- includes cases (in Chapter 5) where data was collected as if standardized instruments were in place.

For these reasons, we see content validity as being no less relevant to our thesis and its outcomes.

Indeed, the purpose of Chapter 3 was to acknowledge precisely the domain of content we purport to have fully and faithfully adhered to in the development of the Social Footprint Method (SFM). Thus, we believe such a content domain exists, and that it is very well established in the sustainability literature. In the development of the SFM, therefore, we made full and frequent reference to it. Of most importance are the following key points:

1. The SFM is designed around the concept of Triple Bottom Line reporting, and is specifically aimed at operationalizing the social and economic bottom lines, even as it embraces a metrical approach already established on the environmental side of the subject (i.e., as reflected in the full-quotient approach implicitly taken by the Ecological Footprint Method). The Triple Bottom Line as an organizing principle is well established in the sustainability literature, and to that extent the SFM is content valid;
2. The SFM is predicated on the concept of organizational sustainability as:
   - referring to the sustainability of an organization's operations or activities,
   - being a function of what its operational impacts are on vital capitals in the world, and

- ultimately gauging human and non-human well-being, as the litmus test of organizational sustainability.

The activity-centric view of organizational sustainability, the capitals-based approach, and the causal effects of organizational/human activity on human and non-human well-being are all well established principles in the sustainability literature, and to that extent, the SFM is content valid.

3. The SFM is further predicated on the view that human, social, and constructed capitals are anthropogenic. This, combined with the existence of multiple moral philosophies that impose duties or obligations on people with discretionary means at their disposal to assist others in need, argues in support of our thesis that the social sustainability of organizations should be measured as a function of the extent to which such organizations do, in fact, contribute their proportionate, and normative, share to the production and/or maintenance of vital capitals in the world, as required by humans and non-humans alike for their well-being. Inasmuch as these ideas are also well established and represented in the literature, to that extent the SFM is content valid.
4. The SFM is applicable to all areas of human need as a basis for determining the social sustainability performance of organizations. While it is true that no specific instrumentations of the method have yet been developed or codified in operational form (apart from our case studies), the method has been designed with placeholders for any and all conceivable areas of human and social impact, as shown in Appendix B, insofar as basic human needs and well-being are concerned. Again, to that extent, the SFM is content valid.

4.6.3.2.2 Construct validity

"Construct validity is defined as representing the correspondence between a construct (conceptual definition of a variable) and the operational procedure [used or proposed] to measure or manipulate that construct" (Schwab, 1980, pp. 5-6). In our case, the construct of interest to us is the *social sustainability performance of organizations,* and the operational procedure we propose for measuring it, of course, is the Social Footprint Method (SFM).

In order to investigate the construct validity of a measurement model or method, a corresponding body of established theory (i.e., an accepted or well-defined nomological network) must exist. “Unless substantially the same nomological net is accepted by the several users of the construct, public validation is impossible” (Cronbach and Meehl, 1955, p. 291). Carmines and Zeller (1994, p. 5) agree: “It should be clear that the process of construct validation is, by necessity, ‘theory-laden’. Indeed, strictly speaking, it is impossible to validate a measure of a concept in this sense unless there exists a theoretical network that surrounds the concept.” They later add, “construct validation ideally requires a pattern of consistent findings involving different researchers using different theoretical structures across a number of different studies” (Ibid., p. 16).

In the relatively nascent field of corporate sustainability management, or CSM, there simply are no such well-established, empirically-rich, and variously-tested theories of social sustainability performance, much less measurement models of the kind we have proposed in this thesis, not to mention the nomological network upon which it rests. Measuring the social sustainability performance of organizations in the way we have proposed has simply never been done before. Thus, the fact that our underlying theory is not yet established or reflected in prior research is not surprising, but it effectively deprives us of any opportunity to test and evaluate our model for consistency, or expected correlations, with other empirical findings, in ways that might otherwise have been possible had others shared our views or interacted with the same nomological net in some way. Indeed, it is precisely because of the lack of such a widely-held perspective in the field that this thesis was proposed. Unfortunately, for the same reason, however, construct validation of the Social Footprint Method was unavailable to us. Of course, if the anthro-capital based theory of organizational (social) sustainability we have proposed here becomes more widely accepted and utilized as a basis for management and empirical research - which we hope it will - construct validity testing of the Social Footprint Method will at that time be possible, and should be revisited, accordingly.

4.6.3.2.3 Face validity

Face validity “concerns the extent to which an instrument ‘looks like’ it measures what it is intended to measure” (Nunnally, 1967, p. 99). “Face validity concerns

judgments about an instrument after it is constructed […] face validity can be considered one aspect of content validity, which concerns an inspection of the final product to make sure that nothing went wrong in transforming plans into a completed instrument [i.e., as a reflection of the content domain it was based on]" (Ibid.).

Notwithstanding the fact that this thesis did not result in the construction of specific instrumentation, it did entail the development of related design specifications, and so face validity considerations are no less germane here. With that in mind, we prepared a series of statements that reflected the key design principles or propositions underlying the SFM, and invited a list of known scholars in the field of sustainability theory and practice to pass judgment on them as they saw fit. This took the form of a short survey structured in terms of Likert scales, a summarized version of which is shown in Appendix C.

In total, twenty-two scholars were invited to participate in our face validity survey, twelve of which agreed to do so. Some of the respondents raised objections to the Likert format, and declined to provide feedback in that form. A few, as well, offered qualitative feedback in the form of evaluative comments, thereby making an overall numerical tally of the responses we received problematic. Still, some statistical summarization is possible.

Insofar as responses to our query regarding overall agreement or disagreement with the approach embodied in the SFM were concerned, most (9 out of 12, or 75%) indicated that they *Agree* with our approach (i.e., as opposed to *Strongly Agree* or other possible responses on our scale). The remaining three respondents to the same query registered their opinions about our overall approach as follows: 2 respondents: no response at all; 1 respondent: *Disagree.* The latter respondent explained his position as follows:

> "I found myself disagreeing with some of your statements for reasons that may have nothing to do with the validity of your overall approach. I saved the 'overall agreement' question for last, and found that the summary of my review was disagreement - that is, I took issue with enough of the statements that I could not claim to agree with your overall approach - even though I like it."

Here we should also report the self-assessed degree of competence to judge the validity of the SFM as rated by the respondents themselves (i.e., their own self-assessments of their expertise in corporate sustainability management and theory). On a scale of 0 to 10, with 0 being lowest expertise and 10 being highest expertise, the respondents rated themselves as follows: 0: no responses; 1: no responses; 2: no responses; 3: no responses; 4: 1 response; 5: 1 response; 6: 1 response; 7: 1 response; 8: 6 responses; 9: no responses; 10: no responses. Two of the twelve respondents declined to rate themselves at all.

Of the responses submitted by the twelve respondents (i.e., to the ten statements shown in Appendix C), a total of 110 individual judgments were made. The distribution of judgments across the 5-point Likert scale was as follows: Strongly Disagree: 3 responses; Disagree: 18 responses; Indifferent: 18 responses; Agree: 52 responses; Strongly Agree: 19 responses. In sum, then, 65% of the judgments made fell on the agreement side of the scale, and 19% fell on the disagreement side. The balance fell into the *Indifferent* category.

Other than the overall level of agreement with the SFM mentioned above, the strongest area of agreement was expressed in response to our statements numbers 1 and 2, which were:

1. *That the most rigorous formulations of sustainability theory and practice in the ecological domain have generally involved assessments of human impacts on the carrying capacity of natural capital.*
2. *That such assessments can be structured in the form of what we call sustainability quotients, where the denominators represent not-to-exceed ecological maximums, and the numerators represent actual ecological impacts. Numerical quotient scores of less than or equal to 1.0, therefore, can be seen as signifying sustainable performance, whereas scores of greater than 1.0 can be seen as signifying unsustainable performance (i.e., due to ecological overshoot).*

Nine judgments, or roughly 8% of total judgments cast for all ten statements in the survey, were cast on the agreement side of the scale for each of these two statements. No other statement received anything less than 5 judgments on the agreement side of the scale, or roughly 5% of total judgments made.

The strongest area of disagreement was expressed relative to our statement number 4, which was: *That the key issue in assessing the social sustainability perfor-*

mance of a human system using anthro capital is whether or not its impact contributes to the production and/or maintenance of such capitals at levels required by a population for basic well-being. Thus, instead of assessing impacts on the carrying capacity of natural capital, in social assessments we assess impacts on the carrying capacity of anthro capital. Five judgments, or roughly 5% of total judgments cast for all ten statements in the survey, fell on the disagreement side of the scale for this statement. Each of the other nine statements we made received at least 1, but not more than 3, judgments on the disagreement side of the scale, or no more than 3% of total judgments made.

4.6.3.3 Validity conclusions

Insofar as the majority of respondents who participated in our face validity survey indicated their overall agreement with our approach, we feel confident in concluding that the Social Footprint Method (SFM) is, on its face, valid. We take a similar position with respect to the method's content validity, having shown, as we did, that the method adequately reflects the domain of content germane to the measurement problem of interest to us. While we would also like to have been able to demonstrate the construct validity of the method, the nomological network we relied on is too new, and too empirically devoid of investigation by others in the literature to have offered any meaningful opportunity to do so. Assuming this changes in the future, the issue of the construct validity of the SFM should be revisited.

4.6.4 Summary

In this chapter, we have shown that it is, in fact, possible to construct a literal, context-based methodology for quantitatively measuring and reporting the social sustainability performance of an organization. In order to do so, we took the societal quotient concept developed in Chapter 3 (see Figure 3.4), and formulated a procedure for how to use it. The resulting five-step process is as follows:

- Step 1: Define boundaries of analysis;
- Step 2: Select specific area(s) of impact (AOIs);
- Step 3: Specify and construct denominator;

- Step 4: Specify and construct numerator;
- Step 5: Compute the quotient score.

The Social Footprint Method (SFM), therefore, is technically composed of two things:

1. a design specification for a measurement model (initiated in Section 3.5 and completed in this chapter), and
2. a process, or method, for using the model, as summarized above.

In our discussion of the steps required to perform the method, several key issues arose.

The first issue was the question of which sustainability theory, or school of thought, ought to be embraced as a basis for using the method. We argued in favor of the CTA approach (see Section 3.4), and against eco-efficiency or other numerator-only approaches, since only the CTA approach explicitly takes context into account. Without such context, there would be no basis for specifying denominators, nor would there be any standards of performance against which the sustainability performance of organizational activities could be measured.

Next came the issue of epistemology, and the theories of truth, legitimacy, and evaluation that one should subscribe to in using the SFM. Since the SFM ultimately reduces to the production of knowledge claims about the sustainability performance of organizations (i.e., both descriptive and normative claims), principles for doing so are key. Using concepts developed in Chapter 2, then, we argued in favor of adhering to a realist epistemology, a correspondence theory of truth (and legitimacy), and a fallibilist theory of evaluation. According to the latter, neither certainty nor consensus is required in order to make knowledge claims, and the absence of either one should never inhibit or prevent use of the method.

We then turned our attention to the issue of moral philosophy, and its role in the use of the method. Since the denominators in our quotients consist of normative claims about what an organization's impacts in the world ought to be, ethics and morality necessarily come into play. It is therefore very important that an organization have a clear picture of what its moral philosophy consists of, so that it can go about the business of specifying duties and obligations in denominators, against which actual impacts expressed in numerators can then be compared. To

help illustrate the influence of moral philosophy in this way, we covered three related bodies of thought that have influenced our own thinking on the matter, consisting of Kutz, Kant, and Rawls. Users of the SFM need not agree with us on our choices, but they must make choices of their own in order to use the method effectively.

Another key issue concerned which areas of impact (AOI) to focus on when using the SFM. Since there are literally dozens, if not hundreds, of such areas potentially affected by an organization's operations, it is very unlikely that any single, or even multiple, applications of the SFM will ever cover them all. Here we returned to the *internal versus external* AOI distinction we earlier introduced (see Section 3.4.3.4, and the more fully elaborated version in Appendix B), and simply raised the issue of how individual AOIs should be selected for measurement and analysis. Along the way, we called attention to one proposal for how to make such choices, as put forward by Porter and Kramer (2006). We will have more to say about this issue in Chapter 6.

Finally, it should be clear that the content of this chapter directly addressed some key issues raised by two of our research questions, which were:

1. whether or not measurement principles relied on in the ecological domain can be applied to the social domain, and
2. if so, how would the resulting tool or method work, and what sort of measurement model would it entail?

Indeed, we think we have shown that such principles can, in fact, be applied - with appropriate modifications, such as the replacement of natural capital with anthro capital - and that the resulting method should consist of a five-step process for constructing societal quotients. It is the quotients, then, that serve as the measurement models, and it is the five-step process to construct them that serves as the method.

Let us now turn our attention to some illustrations of the Social Footprint Method. Accordingly, two applications of the method are presented in Chapter 5, one at Wal-Mart Stores, and the other at Ben & Jerry's.

CHAPTER 5

ILLUSTRATIONS OF THE SOCIAL FOOTPRINT METHOD

5.1 INTRODUCTION

This chapter contains two illustrations of the Social Footprint Method (SFM) applied according to the procedure set forth in Chapter 4. Each case involves a measurement of social sustainability performance relative to an *external* area of impact (i.e., a social condition not confined to the organization itself), for which the responsible population consists of all humans on earth. Each case is further described below.

5.2 WAL-MART STORES, INC.

5.2.1 Introduction

Wal-Mart Stores, Inc. (Wal-Mart) is the largest company in the world with annual sales of $345 billion. It is headquartered in the United States in Bentonville, Arkansas and employs over 1.9 million people worldwide. In total, Wal-Mart operates more than 7,000 general merchandise stores worldwide: 4,000 in the U.S. and 3,000 elsewhere.

In November, 2007, Wal-Mart issued its first ever sustainability report. Its format was a self-styled one, focusing on activities and impacts in three areas: community, associates (employees), and the environment. Like most companies that prepare sustainability reports, Wal-Mart measured and expressed its performance mostly in terms of top-line key performance indicators (KPIs) - performance as measured against standards, by contrast, was largely missing.

Also missing from Wal-Mart's sustainability report was any discussion of its impacts on helping to achieve the UN's Millennium Development Goals (MDGs). Instead, Wal-Mart chose to focus mainly on its community-level philanthropy in the vicinity of its 7,000 stores, the size of which is substantial. This and other information contained in Wal-Mart's sustainability report, in addition to data reported in several of its annual financial reports, constituted the sum total of the data we examined in this case. Before continuing with our discussion of the case, therefore, it is important to acknowledge that the results we report on the pages below were based exclusively from data gathered from only those sources, and no others. This, in part, was done to help simplify the case. The results we report, however, could very well be inaccurate, since other sources of data or information regarding Wal-Mart's impacts on helping to achieve the MDGs, if any, might exist.

Also important to this case is the fact that it was carried out without any direct participation or involvement from Wal-Mart, whatsoever. All of the data required to calculate the company's performance was gathered from Wal-Mart corporate reports, as noted above, and also from various government and NGO sources, including the United Nations, the Organization for Economic Co-operation and Development (OECD), and the U.S. Census Bureau. This shows that Social Footprint analyses can be performed from the sidelines, so to speak, and need not always involve the active participation of the organizations under study.

5.2.2 Discussion of SFM steps taken

This illustration of the Social Footprint Method follows the five steps outlined in Chapter 4.

5.2.2.1 Step 1: Define boundaries

In this case, we opted to confine our analysis of Wal-Mart's social sustainability performance to only its U.S. operations. Thus, the operations we considered included the company's headquarters in Bentonville, Arkansas and its approximately 4,000 stores in the U.S. This is consistent with the boundaries reflected in

Wal-Mart's U.S.-based financial reports for the years included in our analysis, the content of which served as a source for the employee headcount figures we used.

In terms of temporal boundaries, we took an annual perspective, and calculated Wal-Mart's social sustainability performance for each of three years: 2002, 2003, and 2004.

5.2.2.2 Step 2: Select specific area(s) of impact (AOIs)

As earlier noted, this case involved a study of Wal-Mart's impacts on helping to achieve the UN's Millennium Development Goals (MDGs). All eight MDGs and the corresponding sixteen "targets" were considered (see Section 4.6.1.3.2). We made this choice because one measure of a company's social sustainability performance is the impact it has at a global level of analysis, not just a local one, and the MDGs arguably cover that issue quite well. As the largest company in the world, and with international operations, this seemed like a particularly appropriate question to be asking about Wal-Mart. This case, therefore, examined the company's impacts on an *external* set of social conditions in the world (see Appendix B), as manifested (or not) in the production and/or maintenance of related anthro capital.

5.2.2.3 Step 3: Specify and construct denominator

In Section 4.6.1.3.7 (Summary of Step 3), we decomposed Step 3 into eight Substeps. In this section, we will adhere to that outline as we describe the process we followed in specifying Wal-Mart's denominator.

Substep 3.1: This Substep required us to establish a causal theory for the AOI selected in Step 2, and distinguish between cause and effect indicators (or variables) within it. The causal theory we relied on in this case was the one provided by the UN as the basis of its MDG program. That program rests on a commitment to advancing human well-being on earth, and establishes eight major goals for doing so by 2015 (again, see Section 4.6.1.3.2). Regarding the importance of

the MDGs to human well-being, the UN states its position as follows (UNMP, 2005, p. 2):

> "As the most broadly supported, comprehensive, and specific poverty reduction targets the world has ever established, the Millennium Development Goals are too important to fail. For the international political system, they are the fulcrum on which development policy is based. For the billion-plus people living in extreme poverty, they represent the means to a productive life. For everyone on Earth, they are a linchpin to the quest for a more secure and peaceful world."

In order to achieve the Goals, the UN believes that investments must be made in several broad programs at the country level of analysis (Ibid., p. 3). Most important to the achievement and maintenance of human well-being is the mitigation, and eventual elimination, of extreme poverty. Indeed, extreme poverty, according to the UN's causal theory, is at the root of all human misery. The UN elaborates as follows (Ibid., pp. 4 and 6):

> "For the billion-plus people still living in extreme poverty, the Millennium Development Goals are a life-and-death issue. Extreme poverty can be defined as 'poverty that kills,' depriving individuals of the means to stay alive in the face of hunger, disease, and environmental hazards. When individuals suffer from extreme poverty and lack the meager income needed even to cover basic needs, a single episode of disease, or a drought, or a pest that destroys a harvest can be the difference between life and death. In households suffering from extreme poverty, life expectancy is often around half that in the high-income world, 40 years instead of 80. It is common that of every 1,000 children born, more than 100 die before their fifth birthday, compared with fewer than 10 in the high-income world. An infant born in Sub-Saharan Africa today has only a one-in-three chance of surviving to age 65. For people living in extreme poverty, the Goals are ends unto themselves, directly representing the ambition for a longer, healthier, and more fulfilling life. But they are also 'capital inputs' - the means to a productive life, to economic growth, and to further development in the future[.]"

Here, in the passage above, the UN's causal theory is essentially revealed. Assuming we can regard the phrase "…to a productive life, to economic growth,

and to further development in the future" as a reference to *human well-being* - and we think we can - then it should be clear that the UN sees the achievement of its eight MDGs, and especially the mitigation of extreme poverty, as a means of achieving human well-being. Moreover, it refers to the Goals (in their achieved state) as "capital inputs" (to human well-being).

From our perspective, there is a difference between cause (or causal) indicators and effect indicators (see Section 4.6.1.3.2, and Figure 4.1). What the UN is referring to in its MDGs and the sixteen related 'targets' are effect indicators, consisting of desired or intended outcomes in human and social states of affairs. In order to achieve such outcomes, the UN is calling for investments in a variety of social programs, all of which meet our definition of one or more types of anthro capital (see Section 3.4.3.1). It is the existence and quality of such anthro capital that comprises the causal indicators of interest to us and the UN, insofar as they precipitate and support human well-being. By investing, therefore, in the production and/or maintenance of anthro capital in specific areas (i.e., both geographically and by type), human well-being can be greatly improved. The UN argues accordingly for making such investments as follows (Ibid., pp. 7-8):

> "At a deeper level, achieving the Goals is about making core investments in infrastructure and human capital that enable poor people to join the global economy, while empowering poor people with the economic, political, and social rights that will enable them to make full use of infrastructure and human capital, wherever they choose to live[.]"

In order to achieve the Goals, the UN has committed to several specific areas of investment, in particular. They explain as follows (Ibid., p. 64):

> "For all developing countries, but especially those stuck in a poverty trap, we recommend that the MDG-based frameworks to meet the 2015 targets […] should be designed around seven broad 'clusters' of public investments and policies:
>
> 1. Promoting vibrant rural communities, by increasing food productivity of smallholder farmers, raising rural incomes, and expanding rural access to essential public services and infrastructure.

2. Promoting vibrant urban areas, by encouraging job creation in internationally competitive manufactures and services, upgrading slums, and providing alternatives to slum formation.
3. Ensuring universal access to essential health services in a well functioning health system.
4. Ensuring universal enrollment and completion of primary education and greatly expanded access to post-primary and higher education.
5. Overcoming pervasive gender bias.
6. Improving environmental management.
7. Building national capacities in science, technology, and innovation."

From this, we can summarize the causal theory underlying the UN's MDG program as one which asserts that by investing in anthro capital in the seven broad areas listed above, the world will be able to achieve its eight MDG goals for human and social well-being. This theory is largely consistent with the CTA approach to sustainability so fundamental to the SFM (see Section 3.4). It also provided the basis for the specification of Wal-Mart's denominator in this case, since it establishes a theory-based global norm of behavior (i.e., to invest in seven areas of anthro capital in order to improve human and social well-being) that can, in turn, be used as a standard of performance in assessing the social sustainability impacts of an organization.

Substep 3.2: The next Substep in Step 3 of the SFM required that we determine the anthro capital aspects, or components, of the causal variables identified in Substep 3.1, which in turn can be used as a basis for specifying denominator (and numerator) values. Here we need only refer back to the seven areas of investment already identified in our discussion the UN's causal theory above. Contributions made in any one or more of those areas, and in the countries identified by the UN, constitute investments made towards building precisely the kind of anthro capital required to achieve the MDGs (i.e., according to the theory).

To be even more specific, each of the seven areas of investment cited by the UN in its causal theory can be expressed in terms of its anthro capital dimensions: human, social, and constructed. With such a conceptual framework in hand, any investment identified as a candidate for receiving credit towards achieving the MDGs could simply be judged in light of it. Alternatively, one could start with

the candidates, and ask if a case can be made that they, in fact, contribute towards building one or more of the types of anthro capital encompassed by the seven areas.

This latter approach is, in fact, the one we took, since there was no indication, much less claims to the effect, that Wal-Mart had made any such contributions towards achieving the MDGs in the years we studied. Thus, there was little need or incentive to develop a comprehensive anthro capital interpretation of the seven areas of investment. On the other hand, Wal-Mart does pay federal taxes in the U.S., and some proportion of all taxes paid to the U.S. does go to the UN in the form of *Official Development Assistance* (ODA). In an indirect sense, then, we can say that Wal-Mart - and indeed any company that pays federal taxes in the U.S. - does make annual contributions towards achieving the MDGs, in the sense that some proportion of their taxes paid to the U.S. is sent by the government to the UN to help fund their programs.

Here we can also say, by definition, that monetary contributions made to the UN necessarily go towards achieving the MDGs, since everything the UN does now is MDG-related. Thus, unlike cases where contributions are made outside of UN channels (i.e., where the connections to achieving the MDGs are not so certain), monetary contributions made either directly to the UN or indirectly through federal taxes can always be counted on to go towards achievement of the MDGs. In the Wal-Mart case, these were the only kinds of MDG contributions we found (i.e., indirect contributions made via U.S. tax payments), and so our approach to determining the anthro capital aspects, or components, of the causal variables identified in Substep 3.1 was chosen accordingly.

Substep 3.3: This Substep required that we research, select, and/or develop the metrics required to quantitatively express the denominator (and numerator) for the AOI selected in Step 2, and for the anthro capital components identified in Substep 3.2. Because of the fact that the UN itself expresses the input, or contributions, required to achieve the MDGs mainly in monetary terms, we adopted monetary units as the preferred metric for constructing our denominator. Here it should be clear that such monetary units (i.e., money) was used as a proxy for what are otherwise basic units of anthro capital. Instead of measuring inputs in terms of, say, healthcare clinics to be built, the UN - and therefore we, too - has opted to express such inputs in terms of their monetary equivalents.

Table 5.1a Wal-Mart (MDG-related) social sustainability analysis

	2002	2003	2004
number of 'people feet' at Wal-Mart			
number of U.S.-based employees (millions)[1]	1.1	1.1	1.2
average annual proportion of employee time spent working per year (estimated)	0.20	0.20	0.20
number of people-feet (PF) at Wal-Mart in U.S. (millions)	0.22	0.22	0.24
analysis of Wal-Mart per-capita 'official development assistance' (ODA): the denominator			
ODA (as % of GNI) pledged by most OECD countries (incl. U.S.) in 1970 and 2002[2]	0.70%	0.70%	0.70%
monetary value of U.S. ODA if @ .7% GNI (millions)	$71,562	$76,160	$81,138
ODA (as % of GNI) actually contributed by U.S.[3]	0.13%	0.15%	0.17%
monetary value of ODA contributions actually made by U.S. (millions)[3]	$13,290	$16,320	$19,705
U.S. population (millions)[4]	288.0	290.9	293.7
U.S. per-capita/people foot share of ODA if @ .7% GNI (the denominator)	$248.49	$261.85	$276.30
analysis of Wal-Mart per-capita 'official development assistance' (ODA): the numerator			
direct cash contributions by Wal-Mart to development of MDG anthro capital[5]	0.00	0.00	0.00
direct in-kind contributions by Wal-Mart to development MDG anthro capital[5]	0.00	0.00	0.00
direct costs incurred by Wal-Mart in development of MDG anthro capital[5]	0.00	0.00	0.00
taxes paid to U.S. (millions)[5]	$2,941	$3,299	$4,039
monetary value of total U.S. budget outlays (millions)[6]	$2,011,153	$2,160,117	$2,293,006
percentage of U.S. budget outlays spent on ODA	0.6608%	0.7555%	0.8594%
amount of U.S. taxes paid per Wal-Mart PF going to actual ODA contributions by U.S.	$88.34	$113.29	$144.62
total Wal-Mart per-capita (people feet) contributions going to U.S. ODA (the numerator)	$88.34	$113.29	$144.62

Table 5.1b Wal-Mart (MDG-related) social sustainability analysis

	2002	2003	2004
Wal-Mart's social footprint (MDG-related only)			
U.S. per-capita/people foot share of ODA if @ .7% GNI (denominator)	$248.49	$261.85	$276.30
total Wal-Mart per-capita (people feet) contributions going to U.S. ODA (numerator)	$88.34	$113.29	$144.62
size of per-capita (people feet) gap in Wal-Mart contributions to U.S. ODA	$160.15	$148.56	$131.68
societal quotient ('social footprint')[7]	0.36	0.43	0.52

[1] estimated from analysis of Wal-Mart Annual Reports (2002 - 2004)

[2] 1970: UN General Assembly Resolution; 2002: Monterey Consensus (OECD)

[3] source: OECD

[4] source: U.S. Census Bureau

[5] from analysis of Wal-Mart Annual Reports (2004 and 2005)

[6] source: Budget of the U.S. Gov't 2007, historical tables, office of the president

[7] **numerator divided by denominator: ≥1 = sustainable; <1 = unsustainable**

Thus, our entire Social Footprint calculation was performed using monetary values in both the numerator and denominator for each year of analysis (see Tables 5.1a and 5.1b).

Substep 3.4: This Substep required that in cases where a proxy unit of measurement, or metric, is to be used in the denominator, we verify that it actually stands for contributions that would otherwise take the form of real units of anthro capital. Since we did use monetary units as a proxy for anthro capital in this case, this guideline applied. We satisfied this requirement, in response, by referring to the MDG program itself, which specifies inputs required to create and maintain anthro capital in monetary terms. Thus, we simply adopted a proxy that had already been established and calibrated by the UN as a reliable substitute for actual units of anthro capital specified in its programs.

Substep 3.5: This Substep required us to determine whether or not the responsibility for impacts on the AOI selected in Step 2 rested solely with the organization under study, or instead encompassed a broader population. If the latter, it might be necessary to calculate the size of the organization in terms of our *People Foot* metric, especially when computing Social Footprints for the organization as a whole; if the former, we would need to allocate the AOI's entire burden share to the organization in the denominator.

In this case, the responsible population for achieving the MDGs was by no means limited to Wal-Mart's employees. Rather, it consisted of the population of humans inhabiting the countries identified by the UN - and *in agreement with* the UN - who are to serve as the primary funders of the MDG program and its operations. This, of course, includes the United States, which has repeatedly affirmed its commitment to contribute approximately .7 percent of its Gross National Income (GNI) to the UN as Official Development Assistance (ODA) each year. Assuming an equal share of responsibility among all U.S. citizens for meeting this commitment (an assumption we made for simplicity's sake), the per capita burden share for Americans to help achieve the MDGs in the years 2002, 2003, and 2004 works out to $248.49, $261.85, and $276.30, respectively, as indicated in the *Denominator* section of the spreadsheet shown in Table 5.1a.

In this case, then, the responsible population for the prescribed impact on the AOI identified in Step 2 was all humans inhabiting the countries that have made commitments to the UN to help fund the MDGs. It should be clear, however, that

the per capita burden share for people living inside those countries is not the same throughout the world, but *may be* the same *within* individual countries, given the manner in which country-level commitments are made as a percentage of GNI. With all of this in mind, we had a solid basis for defining an equal, per capita burden share of what it would take to fully fund the MDGs at a national (i.e., U.S.) level of analysis. This, however, still left open the question of how to specify an organizational share in the U.S. for Wal-Mart - or, for that matter, any other company in the U.S. That was our next task.

In order to allocate the MDG-related burden share to an organization, such as Wal-Mart, we first had to be certain that the organizational population of interest to us lay completely within the responsible population we had identified. Otherwise, we risked attributing normative obligations to organization members they did not have, because such individuals might actually fall outside of the responsible population we had identified. In this case, the responsible population we had identified was all U.S. citizens, although we had also said that all countries with commitments to the UN comprise the broader responsible population for achieving the MDGs. But since the per capita monetary commitment differs for each such country, we opted to cast our analysis only in terms of *performance measured against American commitments only.* And since we were only interested in evaluating the social sustainability performance of Wal-Mart's U.S.-based operations, this worked well for us, since we could indeed say that the organizational population of interest to us lay completely within the responsible population we had identified (i.e., all U.S.-based Wal-Mart employees are members of the American population, or so we assumed).

Substep 3.6: This Substep required us to form competing knowledge claims as to what the organization's proportionate burden share should be to create and/or maintain sufficient levels of anthro capital (i.e., as required to ensure human well-being in the AOI of interest). We should have then selected the knowledge claim that best survived testing and evaluation through knowledge claim evaluation.

Because of the purely illustrative and experimental purpose of the Wal-Mart MDG case, we did not work this issue too hard. While it was clear that the responsible population for achieving the MDGs certainly includes, but goes beyond, the Wal-Mart employee population, we did not test and evaluate too rigorously the many possible claims about which populations, in particular, should be

viewed as actually responsible for achieving the MDGs. For the sake of simplicity, we decided to treat all humans on earth as responsible, and our quotients were calculated accordingly.

That said, there are clearly problems with the choice we made. First, the responsible population for achieving the MDGs should probably not include the very targets or beneficiaries of the program itself, such as those afflicted by extreme poverty, disease, poor living conditions, etc., and whose desperate conditions in life arguably disqualify them as prospective donors. And even within designated donor countries where conditions are relatively good, not everyone there should be regarded as qualified donors, either. Infants living within the United States, for example, can hardly be expected to have, much less live up to, a moral obligation to contribute to the MDGs. The same could be said for the poor, indigent, mentally ill, imprisoned, and otherwise ill-equipped, handicapped, or hampered members of society whose conditions simply prevent them from acting in any sort of morally proactive way. So it may be that the more defensible claim as to who the responsible population is, or ought to be, for achieving the MDGs, both globally and within a single country, is much smaller than we said - after all, *ought implies can* (see Section 2.3.3.3). In that case, then, the per capita burden share for use in the denominator of our quotient would be much higher than we said, thereby rendering the results of our analysis as largely understated, so to speak.

From this discussion, it should be clear that any decisions made in Substep 3.5 above should be regarded as tentative until such time as Substep 3.6 has been completed. Indeed, whereas Substep 3.5 might clearly result in the view that the responsible population for a particular AOI under study extends beyond the boundaries of an organization, determining just how far it goes, and why, requires further analysis and deliberation. Thus, it is the combination of Substeps 3.5 and 3.6 (not just 3.5) that results in the determination of the responsible population, the answer for which, then and only then, provides a basis for specifying the denominator.

Substep 3.7: This Substep required us to finally populate the denominator with a quantitative value in accordance with decisions reached in Substeps 3.1 - 3.6. As shown in Table 5.1b, the per capita (i.e., per People Foot) values used for years 2002, 2003, and 2004 at Wal-Mart were $248.49, $261.85, and $276.30, respectively.

Substep 3.8: The last Substep in Step 3 required us to determine which of the two types of binary performance scales should be used for plotting and interpreting the results of the quotient calculation. As we pointed out in Chapter 4, this will logically follow from the nature of the denominator chosen for use in the analysis. This is because in some cases the denominator represents a maximum, or not-to-exceed, expectation, whereas in others it represents a minimum, or not-to-fall-below expectation (see Sections 3.5.3.2 and 3.5.3.3, respectively).

In the Wal-Mart case, the values expressed in the denominators consisted of minimum contribution or donation levels required - if generalized across the total human population on earth - to achieve the MDGs. Thus, the binary scale we chose is one on which scores of greater than or equal to one (≥ 1.0) were interpreted as sustainable, and scores of less than one (<1.0) were interpreted as unsustainable. This is consistent with most cases where the SFM has been applied, since anthro capital is anthropogenic and can usually be produced at will. Natural capital, by contrast is not anthropogenic, and therefore imposes limits, or maximums on moral agents, not minimums.

5.2.2.4 Step 4: Specify and construct numerator

Step 4 required us to measure Wal-Mart's actual impacts on helping to achieve the MDGs in the years we considered, and to then populate the numerator of the sustainability quotients involved with the resulting data. Here we considered four possible forms, or means, of making contributions to the MDGs:

1. Direct monetary contributions by Wal-Mart to the UN or to third parties involved in implementing related programs,
2. Direct in-kind contributions by Wal-Mart to the UN or third parties involved in implementing related programs,
3. Other direct costs incurred by Wal-Mart in helping to implement related programs, and
4. Indirect monetary contributions made by Wal-Mart towards achieving the MDGs by way of taxes paid to the U.S. government (see the *Numerator* section of the spreadsheet shown in Table 5.1a).

In order to determine whether, and to what extent, Wal-Mart made contributions towards achieving the MDGs in any of the four forms we identified, we reviewed

a number of documents published by Wal-Mart in the years involved, including their annual reports and website pages pertaining to corporate social responsibility, philanthropy, and sustainability. What we found was that only the fourth category (taxes paid to the U.S. government) revealed contributions made to the UN by Wal-Mart, a type of contribution that all companies make by virtue of how U.S. taxes are applied. No other contributions towards achieving the MDGs were made by Wal-Mart in the years we studied.

In order to populate the numerator of Wal-Mart's MDG-related quotients, we were then required to make a People Foot calculation. This is because the denominator had already been expressed in the form of a per capita value (i.e., the per capita burden share of what it would take to fully fund the MDGs in the years we considered). Thus, what we needed in the numerator was a measure of per capita contributions actually made in the same years. But since Wal-Mart employees only spend part of their lives at work, we could not use the total employee headcount as a basis for making that calculation. Instead, we had to adjust the headcount there in order to reflect the proportion of total time people spend working at Wal-Mart compared to the other parts of their lives.

To make this calculation, we developed an estimate of how much time people spend working at Wal-Mart. This part of our analysis was not based on any direct evidence or data gathered from Wal-Mart publications, but instead was based on general knowledge of how much time people usually spend working in full-time situations. Assuming a forty-hour workweek and fifty-two weeks in a year, a full-time employee at any company will work, and be paid for, 2,080 hours each year, including paid vacations, days off, etc. This works out to about 24 percent of total time spent at work (2,080 hours/8,760 hours). For 2004, we used that figure; for 2002 and 2003, we used 22 percent, reflecting the possibility that not all of Wal-Mart's employees are necessarily full-time workers. This we did for the sake of variety, and not on the basis of any real data.

Given our working assumptions for employee time spent working at Wal-Mart, we then took actual employee headcounts and adjusted them by the same factors. This gave us adjusted People Feet headcounts at Wal-Mart for the years 2002, 2003, and 2004 of 220,000, 220,000, and 240,000, respectively. These figures were then divided into the total value of contributions made by Wal-Mart towards achieving the MDGs in the same years, and the results were then used to populate the company's numerators.

In order to do this, of course, we had to determine what proportion of Wal-Mart's taxes paid to the U.S. could be counted on as going towards the MDGs. This was done by ascertaining actual contributions made by the U.S. relative to total government outlays for the same years. If, for example, in 2002, the government spent 0.6608 percent of its total outlays on ODA to the UN, which it did (see Table 5.1a), then we assumed that the same proportion of taxes paid by Wal-Mart to the U.S. government could similarly be counted as having gone towards the MDGs. The resulting figures were then divided by Wal-Mart's People Foot size for each year, and the results were used as our numerators: $88.34, $113.29, and $144.62 for the years 2002, 2003, and 2004, respectively (again, see Table 5.1a).

5.2.2.5 Step 5: Compute the quotient score

The final Step in the SFM required us to simply compute the quotient scores for Wal-Mart using the denominator values we produced in Step 3 and the numerator values we produced in Step 4. The resulting scores for Wal-Mart were 0.36, 0.43, and 0.52 for the years 2002, 2003, and 2004, respectively. Thus, according to the binary scale decision we made in Substep 3.8, Wal-Mart's social sustainability performance, relative to its impacts on achieving the MDGs in the years we examined, was unsustainable (see Table 5.1b). This is because according to the logic of that scale, all patterns of activity that lead to scores of less than one (<1.0) are, by definition, unsustainable.

In terms of intended audience, the report we prepared for Wal-Mart, of course, was for our own development purposes. We had not been engaged by Wal-Mart to develop the report, nor were there any other consumers or recipients of the report envisioned when we created it. The format we used, however, was intended to be typical of that which might be appropriate for at least internal use at Wal-Mart. Here we were thinking of a sustainability manager, for example, who might want to measure and track Wal-Mart's impacts on the MDGs, both before and after interventions are made in order to manage such impacts. In that regard, the report could serve as a kind of dashboard that managers could use to produce information about the company's actual impacts in the world.

Regarding our decision to cast Wal-Mart's quotients in terms of per capita performance as opposed to organizational performance, we did this because we felt

organization-level reporting is inherently flawed. It is inherently flawed when, in particular, multi-year reporting (and comparisons) are being done, because the boundaries and size of an organization rarely stand still from one year to the next (e.g., Wal-Mart's headcount in the U.S. rose by 100,000 employees from 2003 to 2004). Per capita level reporting, by contrast, offers a means of resolving such disparities, insofar as it makes meaningful inter-annual organizational comparisons possible by resorting to a common denominator. In the Ben & Jerry's case to follow, we will provide an example of where both organizational and per capita reporting was done, and the kinds of statistical distortions that can occur at the organizational level of analysis.

Regarding report format, the spreadsheet shown in Table 5.1a and 5.1b is entirely consistent with the general formatting and content guidelines specified in Chapter 4. Moreover, every decision made, or outcome produced, as a consequence of the Steps discussed above are reflected in that spreadsheet.

5.2.3 Discussion of results

The intent of the Wal-Mart case was:

1. to show that the SFM is a viable method, and that the social sustainability performance of an organization can be measured and reported in a meaningful, quantitative way;
2. that such analyses can be performed independently, without direct involvement from the organizations under study;
3. that normative propositions can be used as standards of sustainability performance, even in the absence of consensus or certainty about them;
4. that the People Foot metric is a useful means of resolving the disparities that can arise when attempting to do organizational sustainability performance comparisons across multiple years; and
5. that social sustainability analyses can be performed on narrow areas of impact (i.e., the MDGs) without having to consider social sustainability impacts in all other areas.

Given these goals of demonstrating how the SFM can work, we think the results were largely, if not completely, positive.

5.3 BEN & JERRY'S HOMEMADE, INC.

Ben & Jerry's Homemade, Inc. (B&J) is a well-known ice cream and frozen yogurt maker with a long and well-publicized history of philanthropy and social activism. The company was started 1978 by Ben Cohen and Jerry Greenfield in a renovated gas station in downtown Burlington, Vermont, and is now headquartered in nearby South Burlington. By 1999, the company's revenues had grown to more than $237 million.

In 2000, B&J accepted an offer by the Anglo/Dutch company, Unilever, to purchase the business for $326 million. Under the terms of the agreement, Ben & Jerry's would operate as a wholly-owned subsidiary of Unilever, with an independent Board of Directors who would provide leadership and continuity for the company's social mission and brand integrity. That structure has stood the test of time, and by the end of 2006, the company had grown to more than 500 people in the U.S. alone.

In 2007, B&J published its eighteenth consecutive annual *social and environmental assessment report* (SEAR) covering performance for the year 2006. Few, if any, companies have been measuring and reporting their social and environmental performance for as long as B&J has. As the company's CEO, Walt Freese, puts it, "This process creates time and space to look back at the path we've traveled each year and determine how to stay on course as a values-led business" (Ben & Jerry's, 2007a).

5.3.1 Introduction

In late 2006, news of the Social Footprint Method's existence had caught the attention of B&J's Social Mission Department (SMD), the group responsible for preparing the company's SEAR report each year, and for generally managing its social and environmental initiatives. The SMD group at Ben & Jerry's is mainly composed of its Director, Rob Michalak, and two key analysts, Andy Barker and Andrea Asch. We were then invited to meet with the SMD team, and to give a brief presentation on the SFM and the theory behind it. What followed was an agreement to pilot the method at B&J's, with the intent of testing and evaluating the concept.

Like many companies, B&J had become increasingly suspicious of top-line-only measurement approaches that perhaps do a good job of tracking social and environmental impacts in terms of trends, but generally fail to measure such impacts against standards of any kind. In other words, what the Social Mission team at B&J was interested in evaluating was the notion of *hard*, versus *soft*, sustainability theory and practice (see Section 3.2.3) - a way of measuring sustainability performance in a more literal, bottom-line sense, where *standards of performance*, not just performance, are involved. This is the story of that evaluation.

5.3.2 Discussion of SFM steps taken

As in the previous case (Wal-Mart), this illustration of the Social Footprint Method at B&J follows the five steps outlined in Chapter 4.

5.3.2.1 Step 1: Define boundaries

Included in the scope of this case was B&J's headquarters operations in South Burlington, Vermont, and its main production facilities in Waterbury, Vermont and St. Albans, Vermont. This accounted for the vast majority of the company's operations.

In terms of temporal boundaries, all data was compiled on an annual basis. The range of years examined was from 2000 through 2006. This particular range of years was determined by the content of the denominator chosen in Step 3 below, which specified standards of performance for those years.

5.3.2.2 Step 2: Select specific area(s) of impact (AOIs)

In this case, an AOI was selected that would serve B&J's primary purpose of wanting to pilot the SFM for possible broader use at the company. The goal was to obtain some first-hand experience with the method, learn how to use it, and determine what issues, or difficulties, if any, might attach to the method. Since, at

the time, we had just completed a prototype of the method involving climate change mitigation, we proposed that the same application be used as a basis for the initial pilot at B&J; the Social Mission team there agreed.

The fact that we chose an AOI that was so obviously tied to an ecological issue prompted then, as it does now, a question about the case: Isn't the Ben & Jerry's case an example of an *Ecological Footprint* analysis, and not a *Social Footprint?* Apart from the fact that we were not proposing to do an Ecological Footprint study in the mold of Wackernagel and Rees (1996), and that for that reason alone the answer to this question would be No, it was No for another more important reason, as well.

In Chapter 3, we defined social footprints, and differentiated them from their ecological counterparts, by distinguishing between societal and ecological quotients in general (see Sections 3.5.3.2 and 3.5.3.3). Here we reaffirm the distinctions we made there, and point out that in order for a sustainability measure to be of an ecological kind, the denominator of the related quotient must specify an ecological standard of performance, not a human, social, or constructed one. Furthermore, we said that an ecological quotient must specify in its denominator some quantity of natural capital that must not be exceeded, which, in turn, is tied to actual ecological thresholds in the world.

Climate change (i.e., global warming) clearly involves a form of natural capital that is being affected by human activity. The particular form of natural capital involved is the capacity of the earth's environment to assimilate greenhouse gases generated by human activity. When we exceed the capacity of the carbon cycle, for example, to assimilate our CO_2 emissions, we can say that the activities responsible for those emissions are unsustainable. By this standard of performance, the verdict is already in - human activities responsible for producing current levels of greenhouse gas emissions are, by definition, unsustainable, since their volumes (of emissions) now greatly exceed the assimilative capacity of the earth to absorb them, and the earth's climate is heating up as a result.

What, then, is humanity to do? In very general terms, what humanity must do is take collective action of some kind to address the problem of climate change. In a sense, then, the nature of the problem here, being an ecological one, is not the point. The point is we have a condition on earth that is undermining human well-being, and collective action of some kind is required to address it. That is

precisely the general pattern that gives rise to Social Footprint applications, since the issue to be addressed is whether or not humans are enabling collective action, by creating and/or maintaining whatever levels of anthro capital may be required to take it.

In the case of global warming, what must ultimately be done, of course, is to lower greenhouse gas emissions. But in order to do that, we must:

1. first develop the knowledge of how to do so (i.e., create some human capital consisting of such knowledge),
2. organize networks of individuals committed to addressing the problem (i.e., create some social capital consisting of knowledgeable individuals committed to working together to address the problem), and
3. create some new sources of energy that are renewable and non-polluting (i.e., create some constructed capital that can replace today's aging, and polluting, power plants).

Once such anthro capital has been produced, it can then be appropriated and brought into service, so to speak, as a resource for taking action by people who need it; such action to consist of lowering greenhouse gas emissions.

What the explanation above envisions, therefore, is a two-step process. First we must create the anthro capital required to take (hopefully) effective action, and then we must take action, with such capital in hand, to, in this case, lower our greenhouse gas emissions and thereby modify our impacts on natural capital. Normally, from a measurement and reporting standpoint, we would do these things in two sequential steps. First we would take a Social Footprint measurement to determine the sustainability of our impacts on the required anthro capital, and then we would separately take an ecological-footprint-type measurement to assess the quality of whatever actions we subsequently took. It should be clear, however, that it is not until the quality or success of actions taken using anthro capital is assessed that we can determine whether or not our investments in building anthro capital were effective. Until then, our estimate of anthro capital resources required to take (hopefully) effective action is a guess, conceived in light of our causal theory (discussed below).

In the B&J case, we had an opportunity to short-cut this process, by utilizing the quality or success of actions taken as a *proxy* for determining the sufficiency of investments made in anthro capital. What made this possible was simply the fact

that investments made by B&J in building anthro capital for climate change mitigation were being instantly appropriated and put into action by B&J themselves, in the form of adjusting their carbon dioxide emissions. In order to take such actions, investments were required to:

1. help people learn how to lower carbon dioxide emissions while maintaining normal levels of business operations,
2. create and commit team resources for implementing mitigation programs, and
3. build new energy production systems (i.e., power plants) that would not run on fossil fuels.

In other words, human, social, and constructed capital would have to be created.

And since the production and/or allocation of such anthro capital resources was being accompanied by their immediate appropriation and use towards lowering CO_2 emissions at B&J, measurable levels of such reductions could be used as a proxy for determining the sufficiency (i.e., sustainability) of related investments. We reasoned that if reductions in carbon emissions met expectations or standards of performance for reversing climate change, we could assume that the underlying investments simultaneously being made in anthro capital were sufficient (or sustainable). If reductions in emissions did not meet our expectations, we could assume the reverse, and that further investments were required. Of course, it is also true that other factors could have been responsible for the changes we observed, but for purposes of this case, we assumed otherwise. Here we can see the important role that causal theories play in our thinking (see Section 4.6.1.3.2), the content of which must be carefully specified, tested, and evaluated.

Thus, this is a case where several (i.e., four) AOIs, not one, were selected for analysis, and where an ecological metric was used as a proxy for measuring impacts on all four in a consolidated way. The four AOIs selected were (see Section 4.6.1.2.1):

1. Internal Human Capital - Safety and Security: Local, National, Global;
2. Internal Social Capital - Safety and Security: Local, National, Global;
3. Internal Constructed Capital - Infrastructure: Power;
4. External Constructed Capital - Infrastructure: Power .

The first AOI consisted of internal individual knowledge and skills about how to lower carbon emissions while maintaining required levels of business operations;

the second AOI consisted of internal shared knowledge and networks required to implement climate change mitigation programs; and the third and fourth AOIs consisted of internal and external technologies required to produce and use energy without using fossil fuels, or to use fossil-fuel based systems more efficiently. Actual and normative levels of carbon emissions were used as a proxy for all four AOIs in this case, but only as surrogate measures of real anthro capital. Since that is the inviolate criterion for when and how proxy measures may be used in Social Footprint quotients (i.e., they must actually stand for anthro capital), this was clearly a case of assessing the social sustainability performance of B&J, and not its ecological performance.

Lest there still be any doubt about this, it is perhaps worth pointing out that if we had done a true ecological-type footprint of B&J's carbon emissions, we would have had to measure such emissions against an ecological constraint, such as the assimilative capacity of the environment (a normative measure of natural capital), and not against emission reduction targets required to mitigate climate change (a measure of human behavior). The former is a constraint imposed by the biophysical properties of natural capital; the latter is a normative state of affairs arising from a social contract or norm. Indeed, if we had done a true ecological-type footprint of B&J's emissions, the result would have almost certainly been negative (i.e., unsustainable), since all carbon emissions on earth clearly exceed the biophysical capacity of the environment to absorb them at present rates. When measured against social standards of (anthro capital) performance, however, many of the same emissions can be interpreted as sustainable because they conform to social norms (e.g., as prescribed by a treaty, perhaps). Thus, we can have emissions behaviors that are ecologically unsustainable and socially sustainable at the same time. In the former case, ecological metrics are being used in a literal sense, with measurements being taken against constraints in natural capital; in the latter case, ecological metrics are being used in a surrogate, or proxy, sense, with measurements being taken against norms or duties to create and/or maintain anthro capital.

5.3.2.3 Step 3: Specify and construct denominator

In Section 4.6.1.3.7 (Summary of Step 3), we decomposed Step 3 into eight Substeps. Here again, we will adhere to that outline as we describe the process we followed in specifying B&J's denominator.

Substep 3.1: This Substep required us to establish a causal theory for the AOIs selected in Step 2. In general, all four AOIs identified above are vital for human well-being, insofar as they help to ensure the security of human habitat (i.e., by contributing to a safe, healthy, and comfortable climate on earth). Furthermore, the last two, the infrastructure AOIs, also help to ensure the security and sufficiency of our energy supplies. Mostly, though, this case was about mitigating climate change, and the investments in anthro capital required to take related action, as discussed above.

The causal theory we relied on to determine just how much, and what kind, of investments in anthro capital would be required to normatively mitigate climate change was provided by a group of scientists known as Wigley, Richels, and Edmunds (WRE) (Wigley et al, 1996; Wigley and Schimel, 2000). Tom Wigley, in particular, a climatologist at the National Center for Atmospheric Research (NCAR) in Boulder, Colorado, worked directly with us to review our use of his work and to provide scientific support as needed. Our work with Tom included a visit to meet with him at NCAR in March, 2007.

It was our choice of the theory developed by WRE that drove our decision to use carbon emissions as a proxy measure for investments in anthro capital. This is because the normative implications of the WRE theory are expressed in terms of changes in carbon emissions that must be achieved if humans are to reverse climate change, and restore conditions to safe and normal levels. WRE, in turn, developed their theory in response to a declaration found in the United Nations Framework Convention on Climate Change (UNFCCC), adopted in March, 1994, which read as follows (UNFCCC, 1994, Article 2):

> "The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate

> system. Such a level should be achieved within a time-frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner."

Solving the global warming problem, therefore, translates into a need to stabilize and restore greenhouse gas concentrations in the atmosphere to safe levels. This, according to the WRE theory, can be accomplished, in part, by managing global carbon emission levels in such a way as to initially allow them to rise - more or less according to their current trajectory during an early transition period - followed by a concerted effort to steadily lower them over time in a deliberate and prescribed way. Given the nature of the carbon cycle on earth as scientists understand it (see, for example, Wigley and Schimel, 2000), the impact of such emissions adjustments can be predicted in terms of what the expected effects on greenhouse gas concentrations in the atmosphere will be. Specific concentration targets can therefore be targeted and, in theory, achieved.

WRE did not, however, specify the actual manner in which reductions should take place at a policy or implementation level, and instead confined themselves to the proposition that:

1. such reductions must happen if safe atmospheric concentrations are to be achieved, and
2. they should happen according to a specific pattern of emissions (i.e., expressed in terms of allowable volumes of emissions per year) as prescribed by their theory.

Ben & Jerry's, however, added to the WRE theory by declaring the manner in which it, for its own part, would actually manage and lower its emissions. In their SEAR 2006 report, the Social Mission team explained its thinking as follows (Ben & Jerry's, 2007b):

> "We have been working to reduce the global warming-causing greenhouse gas emissions that result from making Ben & Jerry's ice cream for several years. Our efforts have included improving efficiencies, investigating the practicality of renewable energy, and offsetting all of the carbon emissions from our manufacturing operations."

These steps, in turn, translated into a need to build and maintain anthro capital in the four areas of impact (AOIs) identified above, the proxy for which is (or can be) *actual and normative changes in carbon emissions.*

Thus, the causal theory at work in this case asserts that in order to mitigate climate change and solve the global warming problem:

1. greenhouse gas concentrations in the atmosphere must be lowered to safe levels,
2. this can be achieved by reducing carbon emissions to prescribed levels in accordance with an understanding of the carbon cycle and other factors, and
3. reducing carbon emissions as a byproduct of human activity can, in turn, be accomplished in three ways:
   - by improving efficiency in energy use,
   - switching from fossil-fuel-based energy to renewable alternatives, and
   - utilizing offsets.

The implications of this theory are further discussed below.

Substep 3.2: The next Substep in Step 3 of the SFM required that we determine the anthro capital aspects, or components, of the causal variables identified in Substep 3.1, which in turn can be used as a basis for specifying denominator (and numerator) values. This we have already done, and explained, in our presentation of the causal theory above.

First, we identified the one causal variable required to restore greenhouse gas emissions to safe levels (i.e., carbon emissions, which must be lowered according to WRE-prescribed levels). Next, we identified the kinds of actions required to have impact on the same causal variable; there were three of them:

1. improve energy efficiency,
2. switch from fossil-fuel-based energy to renewable alternatives, and
3. utilize offsets.

These actions, in turn, require the production and/or maintenance of anthro capital in four forms:

1. Internal Human Capital - Safety and Security: Local, National, Global;
2. Internal Social Capital - Safety and Security: Local, National, Global;
3. Internal Constructed Capital - Infrastructure: Power;

4. External Constructed Capital - Infrastructure: Power.

By creating and maintaining these forms of anthro capital in sufficient quality and supply, the three kinds of action required to have impact on the causal variable of interest to us (i.e., carbon emissions) could be taken.

Substep 3.3: This Substep required that we research, select, and/or develop the metrics required to quantitatively express the denominator (and numerator) for the AOIs selected in Step 2, and for the anthro capital components identified in Substep 3.2. Since we decided to use a proxy in this case consisting of carbon emissions, all of the values expressed in B&J's denominators (and numerators) were formulated in the manner in which such things are customarily measured and reported by scientists in related fields (i.e., in metric tonnes per year, or tC/yr). Given the enormous volumes involved for some of our variables, we sometimes also expressed emissions in terms of giga-tonnes of carbon per year, or GtC/yr (see Table 5.2a).

Substep 3.4: This Substep required that in cases where a proxy unit of measurement, or metric, is to be used in the denominator, we verify that it actually stands for contributions that would otherwise take the form of real units of anthro capital. Since we did use carbon emissions as a proxy for anthro capital here, this requirement applied. Our means of verification here was analytical and argumentative. We simply postulated that the emissions behaviors at B&J, as recorded in the years we evaluated, were, in fact, attributable to actions taken of the three types described above, and that the same actions, in turn, were attributable to investments made in the four types of anthro capital we identified, and that made them (the actions taken), therefore, possible.

Indeed, all advances made in energy efficiency and/or the use of renewable energy at B&J were realized as a result of direct investments made at the individual (human capital) and group (social capital) levels in order to learn how to obtain them, as was the allocation of related human and group resources (i.e., individuals and teams) towards the same ends. Carbon offsets, as well, which in this case took the form of donations aimed at the construction of new, renewable energy power plants, constituted direct monetary investments towards the construction of new (external) constructed capital. Some degree of internal constructed capital was also created in order to fully implement the efficiency and renewable energy solutions mentioned above. To the extent that all of these investments in anthro

capital were arguably responsible for any changes in carbon emissions at B&J in the years we studied, such changes in emissions, we felt, could be interpreted as wholly indicative of the level and sufficiency of the investments made to achieve the intended outcomes.

Substep 3.5: This Substep required us to determine whether or not the responsibility for impacts on the AOI selected in Step 2 rested solely with the organization under study, or instead encompassed a broader human population. If the latter, it might be necessary to calculate the size of the organization in terms of our *People Foot* metric, especially when computing Social Footprints for the organization as a whole; if the former, we would need to allocate the AOI's entire burden share to the organization in the denominator.

In this case, the AOIs we examined clearly entailed responsible populations that include B&J, but went well beyond the boundaries of the organization. The first two AOIs dealt directly with human safety and security at the global level of analysis (i.e., the health of the earth's climate) and the second two did as well (i.e., the quality and sufficiency of public utility systems for global energy). Recalling the logic of denominators set forth above in Substep 3.5 of the Wal-Mart case, it is important when attempting to allocate responsibility for achieving certain (i.e., external) AOI-related goals that the organizational population of interest to us lie completely within the responsible population we have identified. In this case, the responsible population is all humans on earth, and therefore Ben & Jerry's, and all other organizations, can be said to clearly lie within it.

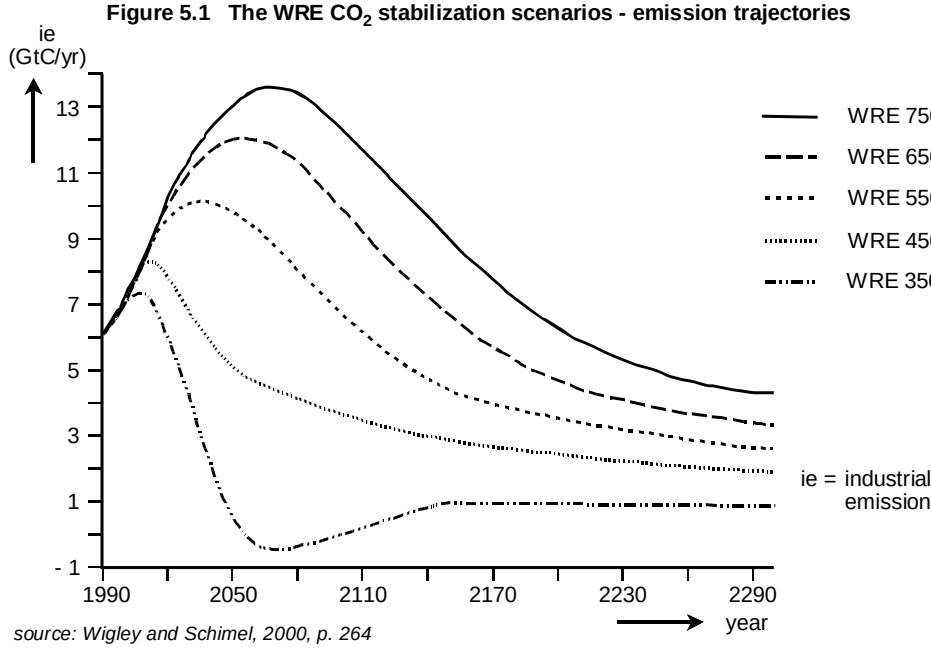
Insofar as whether People Foot calculations were required for denominators in the B&J case, the answer here is both *yes* and *no.* This is because, unlike in the Wal-Mart case, in the B&J case we set out to build more than one type of quotient; in fact, we set out to create four, as explained below:

1. ***An Organization-Wide Cumulative Quotient***
   The first quotient we set out to build was cast at an overall organizational level of analysis. In effect, the question it addressed was: *What was Ben & Jerry's cumulative corporate social sustainability performance in the years 2000-2006, relative to its impacts on climate change mitigation?*

   The denominator of this quotient - and the others to follow - was based on a variant of the WRE theory known as the WRE350 scenario. It is a

multi-year prescription of allowable carbon emissions on earth, which, if adhered to, will purportedly cause greenhouse gas concentrations in the atmosphere (CO_2, specifically) to descend to safe levels (see Figures 5.1 and 5.2). The resulting concentrations specified as a target are 350 parts per million of carbon dioxide, hence the WRE350 moniker. Since the WRE350 scenario specifies allowable carbon emissions for every year, starting in 2000 and ending in 2150, it can be interpreted as if it were a plan for climate change mitigation, consisting of normative, not-to-exceed emissions each year that can, in turn, be applied at both an organizational and per capita level of analysis. The actual emissions performance of a company (i.e., the numerator discussed below in Step 4) could therefore be evaluated against such standards, or norms, of performance. This first quotient, then, was an attempt to perform such an analysis on a cumulative basis (i.e., on an inception-to-date, rolling basis) for the B&J organization as a whole.

Figure 5.1 The WRE CO_2 stabilization scenarios - emission trajectories



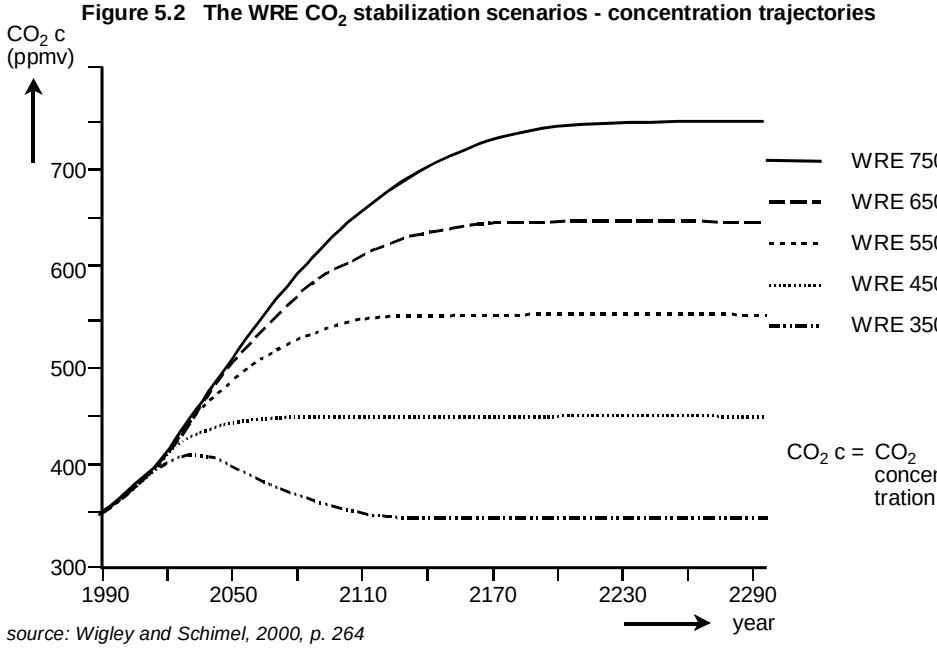
source: Wigley and Schimel, 2000, p. 264

Here, in B&J's own words, is an account of the decision they made to embrace the WRE350 scenario as the basis of a plan for constructing their own denominators (Ben & Jerry's, 2007b):

"[…]we haven't been able to answer one very important question about our company's response to global warming: Exactly *how much* should we be reducing our greenhouse gas emissions each year?

In 2006, Ben & Jerry's began a focused effort to answer this huge question. It's an important question because in order to successfully meet the challenge of global warming as a world community, we need a plan that will share the burden of reducing greenhouse gases in the atmosphere equitably among regions, nations, industries, and individuals.

Figure 5.2 The WRE CO_2 stabilization scenarios - concentration trajectories



source: Wigley and Schimel, 2000, p. 264

We don't have such a plan yet in the United States, where carbon dioxide, the most significant greenhouse gas, is not regulated by the federal government. (We're pushing Congress to fix that through our Lick Global Warming Campaign.)

> So we looked to a [model] that some of the best climate scientists in the world have proposed called the WRE350 [scenario]. It spells out annual limits on the amount of carbon (in the form of carbon dioxide) humans can emit globally over the next 150 years in order to stabilize the concentration of carbon dioxide in the atmosphere at a safe level of 350 parts per million. (A number of other proposed [scenario] aim for higher levels of atmospheric carbon dioxide, ranging from 450 to 750 parts per million. We chose the most aggressive [scenario], which we think represents the best response to global warming.)
>
> Then, in consultation with the Center for Sustainable Innovation, we used a new analytical technique, the Global Warming Social Footprint, to figure out what the WRE350 [scenario] meant for Ben & Jerry's. The purpose of the project was to identify an annual level of carbon emissions that our Company's manufacturing operations could emit (in the form of carbon dioxide) that would represent our proportionate share of the WRE350 [scenario]."

2. ***A Per capita Quotient***
   The second quotient we set out to build was cast in the form of a fairly standard per capita analysis. In effect, the question it addressed was: *What was Ben & Jerry's annual per capita social sustainability performance in the years 2000-2006, relative to its impacts on climate change mitigation?*

3. ***A Weighted Per capita Quotient***
   The third quotient we set out to build was cast in the form of a fairly standard, but weighted, per capita analysis. In effect, the question it addressed was: *What was Ben & Jerry's annual weighted per capita social sustainability performance in the years 2000-2006, relative to its impacts on climate change mitigation?* The decision to build a quotient of this kind was based on the fact that the standard of performance we were using measured performance cumulatively over time, as opposed to only cyclically on an annual basis. In other words, unlike an annual financial report, or an annual sustainability report such as the quotient calculations shown for each year in the Wal-Mart case, in the B&J case, we were, in

fact, looking at both annual and cumulative (i.e., multi-annual) performance over time.

In order to carry performance forward from one year to the next at a per capita level of analysis, then, we had to somehow take changes in B&J's workforce population into account. Had we not done so, the effects of any per capita surpluses or deficits experienced by its workforce in one year versus another would be unduly inherited on a going forward basis, simply because of natural changes in the company's size.[1] By addressing this issue, the cumulative per capita analysis (the fourth quotient described below) could be computed in a way that would avoid the unwanted inter-annual inheritance problem. Moreover, by doing the same for numerators each year (discussed below in Step 4), the results of this quotient would be the same as if we hadn't added the weighting factors at all (i.e., the same as the results received for the second quotient). Thus, it preserved the annual per capita performance we were in interested in seeing, while at the same time laying a better foundation for the fourth, and cumulative, per capita quotient calculation to follow.

4. ***A Cumulative Weighted Per Capita Quotient***
   The fourth quotient we set out to build was cast at a per capita level of analysis on a cumulative basis using the annual figures developed in the third quotient described above. In effect, the question it addressed was: *What was Ben & Jerry's cumulative weighted per capita social sustainability performance in the years 2000-2006, relative to its impacts on climate change mitigation?*

All four quotients described above, and the underlying calculations for each, are shown in the spreadsheet contained in Tables 5.2a, 5.2b, and 5.2c. The bottom-line results for each quotient are highlighted therein, and are arranged in the same order as above, from top to bottom, respectively. We will have more to say about the results shown in our discussion of Step 5 below.

[1] The solution chosen, with input from Professor Hollister of Dartmouth College's Sociology Department, was to simply weight the annual per capita denominators by the actual employee headcount in place at B&J each year.

To come back to the question of whether People Foot calculations were required for denominators in the B&J case, the answer is that they were not in the case of the first quotient, but were in the case of the second, third, and fourth quotients. This is because the first quotient was cast at an organizational level of analysis, not a per capita one; and despite the fact that we said earlier (in the Wal-Mart case), that People Foot calculations for denominators are usually required for organization-level analyses and not for per capita ones, this is a case where the opposite was true, thanks to the nature of the standard we used for measuring performance. That standard essentially grandfathered carbon emissions, at whatever level they happened to be in 2000, as a baseline for the cumulative analysis of performance on a going-forward basis. Thus, in order to perform the B&J analysis in terms of the WRE350 scenario, it didn't matter what B&J's headcount was in 2000 or any other year of our study. All we needed to do was determine what its baseline carbon emissions were in 2000, and what the allowable changes were for each year thereafter, as dictated by the global prescriptions contained in the WRE350 scenario (again, see Table 5.2a). As it turns out, B&J's carbon emissions in 2000 were 1,228 metric tonnes as shown in Table 5.2a.

As for the three per capita quotients featured in this case, People Foot calculations were required in all instances, again because of the special nature of the standard of performance we used. Instead of allocating burden shares on a per capita basis using global population as a starting point (i.e., as we did in the Wal-Mart case), the per capita standard of performance in this case was determined by only B&J's population in the baseline year (i.e., 2000). Thus, in order to determine the allowable per capita emissions in any year of our analysis, we had to first determine what the per capita emissions were in 2000. In order to do that, we had to perform a People Foot calculation, because as we said before, people only spend part of their lives at work. Once we had performed this calculation which revealed per capita/People Foot emissions of 7.02 metric tones of carbon at B&J - we were then able to project annual allowable per capita/People Foot emissions at B&J using the more general pattern of allowable (global) carbon emissions prescribed by the WRE350 scenario.

Before moving on to Substep 3.6, we have one other lesson learned to discuss here. Initially, when we computed the allowable per-People-Foot (i.e., per capita) figures as a basis for the denominators in the second, third, and fourth quotients as discussed above, we based that calculation, as we explained, on year 2000 data per the dictates of the WRE350 scenario and its use of year 2000 data as a base-

Table 5.2a Ben & Jerry's global warming social footprint analysis

	2000	2001	2002	2003	2004	2005	2006
background information for Ben & Jerry's							
reference figure: B&J full-time employees	723	756	819	498	522	505	514
B&J total number of people feet[1]	175	181	196	138	127	129	127
global population (billions)	6.073	6.149	6.224	6.299	6.375	6.451	6.528
global population indexed to 2000 baseline	1.000	1.0125	1.0249	1.0372	1.0497	1.0622	1.0749
carbon emissions required to stabilize CO_2 at 350 ppm: the denominator							
maximum annual global emissions allowed under WRE 350 scenario (GtC/yr)[2]	6.896	6.930	6.964	6.999	7.033	7.067	7.018
maximum cumulative global carbon emissions allowed under WRE 350 scenario (GtC)		6.930	13.895	20.893	27.926	34.993	42.011
allowable annual carbon emissions indexed to 2000 baseline of WRE 350 scenario[2]	1.0000	1.0050	1.0099	1.0149	1.0198	1.0248	1.0177
annual carbon emissions allowed at B&J under 350 ppm scenario (1,228 tC/yr in 2000)[3]	1,228	1,234	1,240	1,246	1,252	1,258	1,250
cumulative carbon emissions allowed at B&J under 350 ppm stabilization scenario (tC): the denominator$_a$		1,234	2,474	3,721	4,973	6,231	7,481
annual carbon emissions allowed per capita/people foot at B&J under 350 ppm scenario based on 2000 baseline of 7.02 tC/yr/people foot reduced for global population growth	7.02	6.96	6.91	6.87	6.82	6.77	6.64
cumulative carbon emissions allowed per capita/people foot at B&J Under 350 ppm scenario (tC): the denominator$_c$		6.96	13.88	20.75	27.56	34.33	40.98

[1] people feet are an alternative measure of headcount. See www.sustainableinnovation.org
[2] source: MAGICC/SCENGEN emissions library at http://www.cgd.ucar.edu/cas/wigley/magicc
[3] base year 2000 estimated from 1996/97 and 2001-2005 data provided in B&J's Social and Environmental Report 2005

Table 5.2b Ben & Jerry's global warming social footprint analysis

	2000	2001	2002	2003	2004	2005	2006
actual net carbon emissions at B&J's: the numerator							
actual annual carbon emissions at B&J's (tC/yr)[4]	1,228	1,292	1,258	1,136	1,278	1,442	1,279
actual carbon offsets purchased - current year accounting (tC/yr)	0	0	0	84	114	816	392
net Annual carbon emissions at B&J's after carbon offsets subtracted (tC/yr)	1,228	1,292	1,258	1,052	1,164	626	887
net cumulative carbon emissions at B&J's (tC): the numerator$_a$		1,292	2,550	3,602	4,766	5,392	6,279
net annual carbon emissions per capita/people foot at B&J's (tC/yr): the numerator$_b$	7.02	7.14	6.42	7.62	9.17	4.85	6.98
net cumulative carbon emissions at B&J's per capita/people foot (tC): the numerator$_c$		7.14	13.56	21.18	30.35	35.20	42.18
B&J's global warming social footprint (CO_2 stabilization-related only)							
actual cumulative carbon emissions at B&J's (tC): the numerator$_a$		1,292	2,550	3,602	4,766	5,392	6,279
cumulative carbon emissions allowed at B&J's under 350 ppm stabilization scenario (tC): the denominator$_a$		1,234	2,474	3,721	4,973	6,231	7,481
global warming societal quotient 'a' expressed in terms of organization-wide cumulative emissions perspective[5]		**1.047**	**1.031**	**0.968**	**0.958**	**0.865**	**0.839**
actual annual carbon emissions per capita/people foot at B&J's (tC/yr): the numerator$_b$		7.14	6.42	7.62	9.17	4.85	6.98
annual carbon emissions allowed per capita/people foot under 350 ppm scenario (tC/yr): the denominator$_b$		6.96	6.91	6.87	6.82	6.77	6.64
global warming societal quotient 'b' expressed in terms of annual per capita/people foot perspective[5]		**1.025**	**0.928**	**1.110**	**1.344**	**0.717**	**1.051**

[4] source: B&J Social and Environmental Report 2005

[5] **≤1 = sustainable; >1 = unsustainable; computed as: numerator/denominator**

Table 5.2c Ben & Jerry's global warming social footprint analysis

	2000	2001	2002	2003	2004	2005	2006
B&J's global warming social footprint (CO_2 stabilization-related only) - continued							
actual annual carbon emissions (weighted) at B&J's (tC/yr): the $numerator_{bw}$	1,228	1,292	1,258	1,052	1,164	626	887
annual carbon emissions allowed (weighted) under 350 ppm scenario (tC/yr): the $denominator_{bw}$	1,228	1,261	1,355	948	866	873	844
global warming societal quotient 'bw' expressed in terms of annual per capita/people foot perspective[5]		**1.025**	**0.928**	**1.110**	**1.344**	**0.717**	**1.051**
actual cumulative carbon emissions at B&J's, weighted (tC): the $numerator_{c}$		1,292	2,550	3,602	4,766	5,392	6,279
cumulative carbon emissions allowed under WRE 350 scenario, weighted (tC/yr): the denominator		1,261	2,616	3,563	4,429	5,303	6,146
global warming societal quotient expressed in cumulative per capita/people foot		**1.025**	**0.975**	**1.011**	**1.076**	**1.017**	**1.022**

[4] source: B&J's Social and Environmental Report 2005

[5] **≤1 = sustainable; >1 = unsustainable; computed as: numerator/denominator**

line. Implicit in that baseline, however, was the global population of humans on earth at the time. When we performed our People Foot calculation for B&J in 2000, we were implicitly, therefore, computing the number of People Feet in the company against the then-current global population as the baseline scenario.

Since the earth's population has increased in the subsequent years, it is important to adjust B&J's allowable emissions in the same years (i.e., which were computed as a function of their baseline year 2000 performance) by a factor which takes these changes in global population into account.

In other words, if no changes in the earth's population had taken place in years 2001-2006, no adjustments in B&J's allowable overall or per capita/People Foot emissions as a function of the baseline year per WRE350 would be needed. But since the global population, in fact, grew in each of those years, B&J's allowable overall and per capita/People Foot emissions needed to be adjusted downward by the proportionate amounts, so as to reflect the fact that there were more people on earth each year, among whom *burden shares* for mitigating climate change as dictated by the WRE350 scenario must be assigned. The final figures we used for allowable annual carbon emissions at B&J, at both an organizational and a per capita/People Foot level of analysis, as shown in Table 5.2a, were adjusted, accordingly.[1]

Substep 3.6: This Substep required us to form competing knowledge claims as to what the organization's proportionate burden share should be in order to create and/or maintain sufficient levels of anthro capital (i.e., as required to ensure human well-being in the AOI of interest). We should have then selected the knowledge claim that best survived testing and evaluation through knowledge claim evaluation.

Here we largely deferred to the content of the causal theory we relied on in this case, the WRE350 scenario. Since that theory essentially grandfathers actual levels of carbon emissions on earth in year 2000 - wherever they may have been, and whoever may have produced them - and then specifies allowable emissions on a going-forward basis as a function of that baseline, it was easy to assign a

[1] Again, this insight was gained with input from Professor Hollister of Dartmouth College.

burden share to B&J for what it will take to return greenhouse gas concentrations to safe levels. We simply followed the scenario (again, see Table 5.2a).

For any given year, B&J's burden share, like any other organization's, is determined by the WRE350 scenario - it is its actual year 2000 emissions multiplied by the general level of allowable increases and/or required reductions specified in the scenario's prescriptions. Assuming all baseline emissions are, in fact, retained by their year 2000 sources, and not reassigned to other parties for any reason, the assignment of burden shares amongst the earth's inhabitants for any year after 2000 can easily be made by simply referring to the WRE350 scenario. This is what we did at B&J. First we determined what its baseline year 2000 emissions were, and then we referred to the WRE350 scenario to determine what the company's burden shares should be for each subsequent year, given the scenario's directives as to how much higher or lower emissions should be relative to the baseline year.

As in the case of Wal-Mart, we made no attempt at B&J to moderate or adjust burden shares on a per capita basis according to economic status, maturity, health, age, or any other discriminating variable amongst the members of a population. This was done for the sake of simplicity.

Substep 3.7: This Substep required us to finally populate the denominator with a quantitative value in accordance with decisions reached in Substeps 3.1 - 3.6. As shown in Tables 5.2b and 5.2c, and as explained above, there were actually four quotients with four separate sets of denominators in this case. Each such set of denominators (i.e., laid out in a multi-year fashion) is shown in conjunction with the four corresponding sets of quotient scores produced in this case, which are highlighted in bold in Tables 5.2b and 5.2c.

Substep 3.8: The last Substep in Step 3 required us to determine which of the two types of binary performance scales should be used for plotting and interpreting the results of the quotient calculations. As we pointed out in Chapter 4, this will logically follow from the nature of the denominator chosen for use in the analysis. This is because in some cases the denominator represents a maximum, or not-to-exceed, expectation, whereas in others it represents a minimum, or not-to-fall-below, expectation (again, see Sections 3.5.3.2 and 3.5.3.3, respectively).

Whereas in most social sustainability cases, such as the Wal-Mart case, scores of greater than or equal to one (≥ 1.0) will signify sustainable performance (because it means that an organization is meeting or exceeding a *minimum* expectation to help build and/or maintain anthro capital), the opposite was true in the B&J case. This is because we happened to be using a proxy that specifies normative compliance in terms of *not exceeding maximums* (i.e., not emitting any more carbon than the WRE350 scenario allows). Thus, the binary scale we chose in the B&J case is one normally associated with ecological quotients, whereby only scores of less than or equal to one (≤ 1.0) signify sustainable behavior, and any score of greater than one (>1.0) signifies unsustainable behavior.

5.3.2.4 Step 4: Specify and construct numerator

Step 4: Step 4 required us to measure B&J's actual impacts on helping to build and/or maintain anthro capital in the AOIs we examined, and to then populate the numerators of the sustainability quotients we built with the resulting data. Once again, there were four such quotients, and the units of measurement we used consisted of carbon emissions (i.e., a proxy measure). Each such set of numerators, laid out in a multi-year fashion, is shown in conjunction with the four corresponding sets of quotient scores produced in this case, which are highlighted in bold in Tables 5.2b and 5.2c.

As in the case of denominators, People Foot calculations were required for the numerators of the second, third, and fourth quotients, but not the first. This is because the first quotient was cast at an organizational level of analysis, while the other three were all per capita measures. The same logic previously used for denominators therefore also applied to numerators, insofar as where and why People Foot calculations were made. Once normative behavior had been expressed in per capita terms in denominators, numerators were necessarily required to follow suit.

The data shown in the numerators of B&J's quotients reflect the results of the company's efforts in all three programs, or initiatives, earlier identified as constituting areas of investments made in anthro capital (i.e., improvements in efficiency, opportunities to use renewable energy, and investments in carbon offsets). The third initiative, in particular, had a major impact on B&J's actual emis-

sions, as can been seen from the data contained in Table 5.2b. There, in the *Numerator* section of the Table, it can be seen that offsets came into play starting in 2003, and played a decisive role ever since. In the case of B&J, all such investments in offsets took the form of contributions to a company called Native Energy, whose use of the money received from B&J was confined to construction of new wind-power energy plants. As a matter of policy at B&J, none of its contributions to Native Energy were to be used for the operating expenses of such plants, only new capital construction. Here we can see a very vivid and literal case of how B&J's actions went towards the creation of new anthro (i.e., constructed) capital.

5.3.2.5 Step 5: Compute the quotient score

Step 5: The final Step in the SFM required us to simply compute the quotient scores for B&J using the denominator values we produced in Step 3 and the numerator values we produced in Step 4, for all four quotients developed. The resulting scores are shown in the bold text in Tables 5.2b and 5.2c, with the first one corresponding to the cumulative organizational view, and the other three consisting of the per capita/People Foot analyses. All actual scores received are further discussed in the next section below.

In terms of intended audience, the report we prepared for B&J was designed both for internal management purposes, and also for external reporting to stakeholders. Indeed, many important results from the analysis were included in B&J's online SEAR 2006 report, in addition to being used for internal planning purposes. Insofar as the latter is concerned, here's what the company had to say about that in its report (Ben & Jerry's, 2007b):

> "In 2007, we'll take what we've learned from this Global Warming Social Footprint and use it in developing a specific climate change plan."

In terms of content, four separate quotients were developed as explained above. In so doing, our intent was to rely mainly on the per capita quotients, since the company-level analysis (i.e., the first quotient) was expected to mask any differences in organizational size or scope that would have occurred from one year

to the next. Indeed, as the data shows in Table 5.2a, the company's size did fluctuate dramatically during the years we studied, ranging from a high of 819 employees in 2002, to a low of 505 employees in 2005.

In terms of format, the B&J report shown in Tables 5.2a, 5.2b, and 5.2c was otherwise consistent in every way with the guidelines for SFM reporting contained in Chapter 4.

5.3.3 Discussion of results

Let us now turn our attention to the resulting scores in all four quotients computed in this case by focusing on the bolded results contained in Tables 5.2b and 5.2c. Reading from top to bottom, we can see that the scores achieved for the first quotient (i.e., the company-wide, or organizational, view) gradually improved from unsustainable in years 2001 and 2002, to sustainable in years 2003-2006. Indeed, the company-wide scores improved every year, with 2006 being the best year for that series (i.e., a score of 0.839).

As noted above, however, B&J's size varied dramatically in the years we studied. Thus, no two years were alike in terms of company size and scope, and so the scores received in the years we examined were arguably incomparable. In order to address this issue, we turned to the development of per capita/People Foot quotients, both for individual years in isolation and for cumulative scoring.

The first and second per capita/People Foot quotients we developed (i.e., the second and third bolded ones in Tables 5.2b and 5.2c) yielded the same scores, since the third one was merely the same as the second one, albeit with employee headcounts being used in both the numerators and denominators to weight the variables. As explained earlier above in our discussion of Substep 3.5, we did this in the case of the third quotient in order to prevent the unwanted inheritance of surpluses and deficits that might arise, as data associated with different employee headcounts in different years are combined in the fourth quotient. In any case, we can see from the year-by-year analysis of per capita/People Foot performance that B&J was socially sustainable, in terms of the AOIs we examined, in only two of the years we studied: 2002 and 2005. On the other hand, most other years, except for 2004, were only marginally unsustainable.

The fourth and last set of quotient scores shown in Table 5.2c is arguably the most important and valuable one, because it:

1. presents a per capita/People Foot view and in that way resolves inter-annual differences in company size,
2. is based on weighted annual data, accordingly, and
3. is cumulative in construction, and thereby better fits the underlying standard of performance, which is also cumulative in construction (i.e., the WRE350 scenario).

Indeed, according to the WRE350 scenario, a failure to comply with its dictates in one year can always be made up with an improvement in performance the next. It is the cumulative performance on a rolling basis over time, therefore, that matters most in interpreting a company's performance relative to the WRE350 scenario. Thus, the most important score is the most recent one.

With this in mind, we can see in the scores B&J received for the fourth quotient that for the most part, their performance for all six years studied was, strictly speaking, unsustainable, but only marginally so. Of most importance, perhaps, is the conflict revealed between the cumulative company-wide scores and the cumulative per capita/People Foot scores (i.e., between the first and fourth quotients). This we attribute to the inability of company-wide analyses to adjust or compensate for major swings in employee headcounts, which again is one reason why we favored the fourth, per capita/People Foot set of scores. It was the fourth quotient, therefore, that we felt provided the best and most meaningful view of B&J's true sustainability performance in this case.

On the whole, B&J's performance was quite good in the years we studied, thanks in large part, we think, to the quality and extent of the investments they made in carbon offsets. As long as the company continues to make such investments in these and other forms of climate-related anthro capital, it is very likely that they will more than meet the requirements of the WRE350 scenario, and ultimately go carbon neutral, or better, in the years ahead.

It should be clear from a review of the two cases above, we think, that the Social Footprint Method is not entirely free of issues, and that choices must be made regarding variables (and values) fundamental to its use. In the next chapter, we endeavor to acknowledge and discuss these issues in a more deliberate fashion, as well as to indicate where we think the method should go from here, in order to

become more fully operationalized and ready for prime-time use. We also attempt to summarize our answers to the research questions we raised in Chapter 1.

CHAPTER 6

CONCLUSION AND DISCUSSION

6.1 INTRODUCTION

This chapter is organized into two main sections. The first section (Research conclusions) contains a summary of our answers to the research questions initially raised in Chapter 1 (see Section 1.4). The second section (Closing discussion) contains a summary and discussion of several key issues and implications raised by the Social Footprint Method, and a final subsection on where we think the method should go from here, insofar as its further development and use is concerned. We begin with our summary of research findings.

6.2 RESEARCH CONCLUSIONS

This thesis was motivated by our general dissatisfaction with the state of the art in available tools and methods to measure the social sustainability performance of organizations. In our view, no such instruments exist of a satisfactory kind. Thus, we set out to close this gap by creating a new social sustainability performance measurement tool called the Social Footprint Method (SFM). The research issues we addressed along the way were driven by the following major questions, as earlier noted in Chapter 1:

1. Are there any organizational sustainability measurement and reporting methods that actually (or purport to) measure and report sustainability performance in a literal (i.e., context-based) way?
    - If so, in what sense do they measure and report sustainability performance?
    - What are the key principles or assumptions behind such methods?
    - What are the key differences between the methods (with respect to scope and validity), and can it be argued that some methods are more effective than others?

   - What are the explicit or implicit epistemologies behind such methods?
2. If literal methods exist, do they measure social sustainability performance?
   - If so, which ones and how do they work?
3. If existing, literal methods do not address social sustainability performance, can the measurement principles they rely on in other domains be applied to the social domain?
   - If so, how would the resulting tool or method work, and what sort of measurement model would it entail?
   - What would its advantages and disadvantages be over other competing approaches?

The results of our research, relative to the key questions listed above, are as follows:

1. Are there any organizational sustainability measurement and reporting methods that actually (or purport to) measure and report sustainability performance in a literal (i.e., context-based) way?

In general, we find that leading tools and methods used to measure and report sustainability performance in organizations today (e.g., the Global Reporting Initiative, or GRI) fail to function as advertised, and do not measure and report sustainability performance in any meaningful way. This is because of their failure to take what GRI itself refers to as *sustainability context* into account when such methods are used, and in the preparation of related reports. In our terms, GRI, in practice, is a numerator-only scheme (see Chapter 3), and therein lies its weakness.

Not all sustainability measurement and reporting tools, however, suffer from a failure to take sustainability context into account. The Ecological Footprint Method (EFM), for example, explicitly takes such context into account, and thereby makes it possible to measure and report the sustainability of human collectives in a literal way. In our terms, the EFM is a full-quotient scheme, and therein lies its strength.

For purposes of the remainder of this section, then, we will confine ourselves to a discussion and comparison of GRI and the EFM as the two leading, and most emblematic, illustrations of mainstream sustainability measurement and reporting methods in use today.

- *If so, in what sense do they measure and report sustainability?*

As already noted above, GRI, in practice, fails to measure and report sustainability performance at all, thanks to the lack of context (or what we conceive of as denominators) in its measurements. Here we hasten to acknowledge, once again, that the GRI standard does, in fact, recommend that sustainability context be included in related reports; however, we have never seen a GRI report with such context included, including GRI's own report of its own sustainability performance. The inclusion of such context in GRI reports appears to be a standard that is universally ignored.

The EFM, by contrast, is structured in such a way as to always include context. Thus, the ecological sustainability performance of an organization or human collective is determined by comparing its ecological impacts on the capacity of related ecosystems to withstand them, according to their (the ecosystems') limits. It is the limits of such ecosystems that constitutes the relevant context in the case of the EFM, and they are always taken into account, and never ignored.

- *What are the key principles or assumptions behind such methods?*

In the case of the EFM, the key principles behind its measurements include the following:

- The ecological sustainability of human activity is a function of its impacts on the carrying capacity of natural capital. Thus, the EFM relies on the capital theory approach (CTA) to sustainability (see Section 3.4);
- Impacts that exceed the carrying capacity of natural capital (i.e., if universalized) are regarded as unsustainable (see Section 3.5.3.2);
- The carrying capacity of natural capital is defined in terms consistent with Daly's principles of sustainability (see Section 3.4.1).

For its part, GRI is committed to the Triple Bottom Line as a general organizing principle for sustainability measurement and reporting, and also to the inclusion of sustainability context in related assessments. As already noted above, however, GRI reports rarely, if ever, include such context, and the standard itself offers no guidelines, such as Daly's principles or principles of any other kind, that can be used to operationalize context in practice.

- *What are the key differences between the methods (with respect to scope and validity), and can it be argued that some methods are more effective than others?*

There are two key differences between the EFM and GRI that relate to scope and validity. In terms of scope, the EFM is limited to measures of ecological sustainability only, whereas GRI addresses all three 'bottom lines' - social, economic, and ecological.

In terms of validity, the EFM is arguably more valid - as far as it goes - inasmuch as it more fully reflects the content domain of ecological sustainability (i.e., it takes ecological context and related limits fully and explicitly into account). GRI, on the other hand, although broader in scope, fails to take sustainability context of any kind into account, despite its explicit recommendations to the contrary. At the very least, it fails to do so by not providing executable principles and guidelines for *how* to include context, and by leaving it (context) out in the specification of its metrics. Anyone who adheres to GRI's metrics will, therefore, necessarily leave context out of their report, not in.

- *What are the explicit or implicit epistemologies behind such methods?*

In Chapter 2, we relied on a distinction between theories of truth, legitimacy, and related theories of evaluation to distinguish between competing epistemologies. Here we can do the same thing as we compare GRI with the EFM.

Both GRI and the EFM are arguably grounded in realist epistemologies, according to which they are metaphysically committed to the proposition that the world is real and exists. Their challenge, however, is how to describe it (the world) - accurately - with particular regard to the sustainability of organizational activities and their impacts on vital capitals, and also with respect to what such impacts ought to be.

Since neither GRI nor the EFM explicitly state their theory of truth, we must rely on inferences for insight. Here, we at first thought it safe to assume that both methods subscribe to a correspondence theory of truth, since it is the essential purpose of both methods to produce statements that make descriptive assertions about the sustainability of an organization's impacts in the (real) world. GRI, however, introduces a complication in its formulation, according to which its outlook seems decidedly relativistic. While at first GRI seems fully committed to a

capital-based view of *sustainability context* (GRI, 2006, p. 13), it concludes its discussion of the subject with the following statement (Ibid.):

> "The organization's own sustainability and business strategy provides the context in which to discuss performance."

Thus, rather than relying on the status of vital capitals in the world as a basis for measuring and reporting sustainability - which, incidentally, the triple bottom line principle to which GRI subscribes would suggest (Elkington, 1998, Chapter 4) - GRI seems to rely, instead, on the content of organizational strategies for context. This is very much akin to the explicitly justificationist approach taken by Nonaka and Takeuchi in their own epistemology (see Section 2.2.3.1.3), according to which truth or legitimacy is a function of conformance to management dictates (i.e., to what corporate strategies and their authoritative authors call for, notwithstanding the state of the world). Here, for example, is one GRI statement to that effect (GRI, 2006, p. 4):

> "Transparency about the sustainability of organizational activities is of interest to a diverse range of stakeholders, including business, labor, non-governmental organizations, investors, accountancy, and others. This is why GRI has relied on the collaboration of a large network of experts from all of these stakeholder groups in consensus-seeking consultations. These consultations, together with practical experience, have continuously improved the Reporting Framework since GRI's founding in 1997. This multi-stakeholder approach to learning has given the Reporting Framework the widespread credibility it enjoys with a range of stakeholder groups."

While all of that may be true, it has nevertheless produced a method that, on the one hand, calls for consideration of *sustainability context* in the preparation of sustainability reports, and on the other hand, abandons it in favor of relativism. Indeed, if according to GRI, all sustainability reports should ultimately be grounded in the context of corporate strategies, then the same behaviors in two organizations could be judged as sustainable in one case, and unsustainable in the other, merely because the content of their respective strategies might differ. In a world that is real and which is the same for all of us, this simply won't do. GRI's relativism, therefore, arguably disqualifies it as a tool for measuring sustainability performance in the world, where absolute impacts on vital capitals can affect

the sufficiency of their flows for human well-being. Indeed, the varying content of corporate strategies, here and there, is irrelevant.

In the EFM, by contrast, we find no such epistemological contradictions. While the quality or fidelity of the claims it produces can always be questioned, there is no trace whatsoever (in the EFM) of the kind of epistemological relativism we see in GRI. Instead, the correspondence theory of truth and legitimacy seems to hold sway, as it *should* in a world that is real. Moreover, whereas GRI explicitly relies on consensus and the authority of experts to construct its measurement model, the EFM is openly fallibilist and non-authoritarian in its outlook (Wackernagel and Rees, 1996, p. 18):

> "Not knowing something with certainty should not deter us from taking action or counter-action."
> …..
>
> "In short, we may not know exactly how nature works, but by using fundamental laws and known relationships, we can calculate useful (under) estimates of human demands."

In sum, we think we can safely conclude that GRI is:

- confused, and confusing, about its own theory of truth,
- is justificationist in its theory of evaluation, since it relies on an appeal to the authority of experts, consensus, and managers, and
- ultimately fails to take capital-based sustainability context into account, notwithstanding its advice to the contrary.

The EFM, by contrast, also relies on a realist epistemology, while holding to a correspondence theory of truth (and legitimacy), and a fallibilist theory of evaluation. This particular combination is one that we ultimately felt should be preserved and upheld, as we attempted to reverse-engineer and adapt the EFM to the social context.

2. If literal methods exist, do they measure social sustainability performance?

The only *literal* sustainability measurement and reporting tool we know of is the EFM. It is literal, by our definition, because it is full-quotient in form, and always, therefore, measures performance against standards of performance, or a-

gainst context. Still, the EFM does not measure social sustainability performance, only ecological performance.

- *If so, which ones and how do they work?*

Again, we know of no social sustainability measurement and reporting tools or methods that are literal, by our definition, or full-quotient in form.

3. If existing, literal methods do not address social sustainability performance, can the measurement principles they rely on in other domains be applied to the social domain?

Again, the only literal sustainability measurement and reporting tool or method we are aware of is the EFM. The remaining two subquestions below are answered in that light.

- *If so, how would the resulting tool or method work, and what sort of measurement model would it entail?*

Referring to our response to question 1b above, we have shown that it is possible to apply the principles relied upon for literal ecological sustainability measurement and reporting to the social domain. Our thinking is as follows:

- The social sustainability of human activity can be determined as a function of its impacts on the carrying capacity of anthro capital (i.e., human, social, and constructed capitals). Thus, just as the EFM relies on the capital theory approach (CTA) to sustainability, so can a Social Footprint Method (SFM) do so, as well (see Section 3.4.3);
- Impacts that fail to produce and/or maintain the carrying capacity of anthro capital (i.e., if universalized) as required to ensure human well-being are regarded as unsustainable (see Section 3.5.3.3);
- The carrying capacity of anthro capital is defined in terms consistent with notions of human well-being and the role that anthro capital plays in ensuring it (see Sections 1.1.1.1 and 3.4.3.2).

On the basis of the above, we can say that the general principles involved in measuring and reporting the ecological sustainability performance of an organizational can be applied - with some important modifications - to the assessment of social performance. The primary differences are

- the need to replace natural capital with anthro capital, and

- the need to reverse the logic of sustainability from not exceeding the carrying capacity of natural capital, in the ecological case, to not failing to produce and/or maintain required levels of anthro capital in the social case.

The latter difference arises from the fact that whereas natural is not anthropogenic, anthro capital is. Sustainability performance norms must be reoriented, accordingly.

- *What would its advantages and disadvantages be over other competing approaches?*

The advantages of such a method would include the following:

- The social sustainability performance of an organization could be expressed in terms of its proportionate impacts on vital anthro capital, relative to what its proportionate impacts ought to be;
- The normative impacts of an organization on vital capital could be grounded in the normative duties and responsibilities of its workers, whose personal individual moral responsibilities arguably attach to their actions and behaviors in the workplace, and which are not absolved or negated by it (the workplace) in any way;
- The behaviors and impacts of organizations on the status of vital capital in the world could therefore be seen as arising from the performance of joint acts on the part of the individuals who work for them, and in their name;
- The real social sustainability performance of an organization could be measured and reported in non-relativistic terms, with sustainability context fully included, and with the proportionate degree of organizational responsibility for producing and/or maintaining vital capital appropriately (and quantitatively) taken into account;
- The anthropogenic nature of human, social, and constructed capitals, versus the non-anthropogenic nature of natural capital, could be highlighted and reinforced, as a basis for measuring and reporting the social sustainability performance of organizations. Here, the principle of maintaining capitals at levels sufficient in quality and supply to ensure human well-being could be better understood, recognizing that doing so in some cases (i.e., the ecological ones) might mean decreasing demand, while in others (i.e., the social and economic ones) might mean increasing supply;

- The triple bottom line concept could, for the first time, be fully operationalized in a way that is true to the capital basis of the concept (Elkington, 1998, Chapter 4), by filling in the missing pieces not already provided by other, analogous, capital-based ecological tools, such as the EFM.

The disadvantages of such a method and model would include the following:

- The normative aspect of the model is highly controversial, since many believe that values and claims about the good, the right, and the beautiful, or the way the world ought to be, are entirely relative and subjective. Overcoming this objection with an argument that suggests that value claims can, in fact, be objective, and that there can be a correspondence between such claims and *the way the world ought to be* could prove to be intractably problematic in the end;
- The core concept of anthro capital, upon which the SFM rests, is also highly controversial, with many competing definitions in use for human, social, and constructed capitals, and just as many disputes over whether such constructs can be measured at all. This, too, is a highly controversial subject, the lack of consensus for which could hinder the adoption and effectiveness of the method;
- Strictly speaking, the method (i.e., the SFM) is a design specification or template for social sustainability measurement models; it is not a measurement model or instrument that can be used without further development. In order to use the SFM, therefore, specific indicators must be defined and applied in ways prescribed by the model (i.e., in the form of quotient-based instruments). The subject of indicators, however, is also highly controversial and is plagued with disagreements over which ones can do a proper job of measuring the status of vital capitals, human well-being, etc. This is particularly true in the case of the SFM, since the object of its focus is a largely intangible one: organizational impacts on the quality and sufficiency of anthro capital for human well-being. Thus, even if we can get people to agree on the other issues noted above, we will still be left with choices to be made on which specific indicators to employ. This, too, could have a dragging effect on the adoption of the method;
- Compared to numerator-only methods, such as GRI, the method we describe here is more difficult to apply, since the denominators it entails require data or information usually not maintained by organizations (e.g., poverty rates in the world and the status of other human and social conditions), and also the choice and declaration of specific moral philosophies

or policies that can be used to help specify the type and extent of duties or obligations have to help meet the needs of others. Most organizations are simply not used to doing such things, and the need to do so as a requirement for using the method could therefore serve as another barrier to it its adoption.

6.3 CLOSING DISCUSSION

6.3.1 Issues and implications

We would indeed be remiss if, in concluding our thesis, we did not attempt to at least acknowledge and respond to certain key issues and implications raised by what we have said and done here. What follows below, then, are eight brief acknowledgments of, and responses to, important issues evoked by the Social Footprint Method (SFM).

6.3.1.1 The poverty of GRI

Perhaps the most striking implication of the SFM is the extent to which it shows how leading sustainability measurement and reporting standards in the world, especially GRI, utterly fail to do the one thing they purport to do - which is make it possible to measure, report, and understand the sustainability performance of an organization. And even though it is true that the GRI standard does advocate for the inclusion of sustainability context in related reports, it:

1. fails to provide guidelines for how to do so,
2. fails to do so itself in its own reports,
3. fails to enforce the standard in other organizations' reports as a consequence of its metrics, and
4. fails to adequately explain such context in normative terms, thereby encouraging sustainability programs and practices of a largely supererogatory kind.

Thus, the GRI standard as a policy for guiding organizational sustainability measurement and reporting in the world is a failure of the most profound kind.

6.3.1.2 Eco-efficiency, 'green', and social sustainability

Similarly revealed by the SFM is the inadequacy of what most organizations are doing today relative to improving their sustainability performance, beginning with their ecological impacts. Thanks, in part, to GRI and its metrics, so-called eco-efficiency and 'green' initiatives lack context, and merely translate into ongoing attempts to lessen impacts on the environment, as if lessened impacts necessarily translate into 'more sustainable this year than last'. They do not. As McDonough and Braungart (1998) point out, "Relying on eco-efficiency to save the environment will in fact do the opposite - it will let industry finish off everything quietly, persistently, and completely." Unless an organization's use of natural resources is equal to or below its proportionate share of what its levels of use ought to be - and not just less this year than last, while being above in both cases - its operations will be unsustainable. And to the extent that 'green' usually means eco-efficient, which it does, 'green' is therefore unsustainable, too. The hypocrisy here is palpable.

To makes things worse, none of this even begins to address the fact that social considerations are virtually missing from corporate sustainability programs defined mainly in terms of eco-efficiency or 'green' initiatives; or that even when they are included, they tend to suffer from the same missing denominator disease. To simply list an inventory of philanthropic contributions made to a local community or program is not to measure and report on an organization's social sustainability performance in any meaningful sense. How could it be? There are no standards of performance involved. Thus, most of what passes for social sustainability reporting, like eco-efficiency and 'green' initiatives, is virtually devoid of context, and thereby leaves the question of sustainability performance wide open. By contrast, the Social Footprint Method explicitly includes context - *always* - and is arguably, therefore, the first and most literal social sustainability measurement and reporting tool to appear in the CSM arena.

6.3.1.3 Duties and social contracts

The epistemological approach taken in this thesis not only suggests that we should think of sustainability measurement and reporting as a knowledge production process, but also that the sustainability performance of an organization should be assessed against normative duties and obligations of some kind. We earlier raised the subject of social contract theory in our discussion of John Rawls' philosophy (see Section 3.6.2.3), but we think this topic requires much more emphasis and thought on a going forward basis, as the SFM comes into wider use, which we expect it will. Indeed, the very choice of which areas of impact (or AOIs) to focus on when measuring the social sustainability performance of an organization depends, we think, on the identification of duties or obligations owed by an organization to its stakeholders. Where, if not in a social contract of some kind, should the specification of such duties and obligations be found? It is for this reason that we think implicit social contracts between organizations and the societies in which they operate should be made *explicit*, so as to make social sustainability measurement and reporting more meaningful and less ad hoc.

Here it is perhaps worth commenting, as well, on the Porter and Kramer (2006) approach for choosing AOIs earlier discussed in Section 4.6.1.2.2 above. In effect, their approach is the antithesis of the social contract approach. What they argue for, instead, is the choosing of AOIs on a purely self-serving, instrumental, and profit-driven basis. In cases where enhancing social conditions in the world also happen to serve the financial performance of organizations, they suggest that related choices of AOIs for management, measurement, and reporting should be made, accordingly - but only in those cases. None of that entails social contract theory in any respect, nor is it predicated on any sense of duty or obligation owed to stakeholders. In effect, the Porter and Kramer approach is morally neutral - with the exception of the value they place on increasing shareholder wealth.

6.3.1.4 Shareholder primacy versus sustainability

According to widespread anecdotes, the notorious American bank robber, Willie Sutton (1901-1980), once said, when asked why he robbed banks, "Because that's where the money is." By the same token, if asked why organizations should be expected to contribute towards the production and upkeep of social

well-being, we could essentially give the same answer - especially in light of the steps society takes to make doing business, and the building of personal wealth, possible in a capitalistic system.

A company's resources, however, are always limited, and it usually owes its primary allegiance to its shareholders, as opposed to its other stakeholders. How much of a company's wealth or resources, then, should be contributed towards general social well-being, as opposed to its shareholders' profits, especially in cases where it cannot meet its proportionate 'burden share' of producing and/or maintaining the quality or supply of anthro capitals in the world, or where shareholder expectations (i.e., Wall Street) are high?

This is indeed a tough question, and we have no ready answer for it. Still, it is not inconceivable to us that standards or norms for contributions could be developed. One thing must happen beforehand, however, in order for such progress to be made. Namely, the legal doctrine of *shareholder primacy* so often found in corporate law - especially in the U.S., but often not elsewhere - should be abandoned. Greenfield (2006) puts this idea as follows (p. 28):

> "September 11 should remind us of the importance of building connections, of reaching out to build community. Unfortunately, the aftermath of the tragedies indicates that corporations may be more interested in allowing the few who already have a great deal to amass even more wealth. Perhaps we would want to use the government to create bonds among us, to encourage discussion, to facilitate the sharing of power. Corporate law can be an important part of this process, but only if shareholder primacy is abandoned. If we did so, we could experience the beginning of a new history for corporate law."

Here we note, with interest, the attempts now being made in the U.S. to overturn shareholder primacy by an organization called B Lab (www.bcorporation.net), which is assisting individual corporations, one at a time, with the revision of their bylaws to enable them to engage in social development, rehabilitation, and philanthropy, without running into opposition from their own shareholders. We think this is a step in the right direction, and will only serve to make the SFM more relevant and effective as more organizations take steps to redefine themselves in these terms.

6.3.1.5 Philosophical foundations

Turning to the philosophical side of the SFM, we presented some epistemological and moral positions of importance to the SFM in Chapters 2 and 3. In response, one could reasonably ask if the perspectives we laid out are mandatory or discretionary, insofar as the viability and use of the SFM is concerned. To answer this query, let us unpack the question and break it down into three parts:

1. metaphysics,
2. epistemology, and
3. moral philosophy.

In terms of metaphysics, we are clearly committed to realism, or to the proposition that the world is real and exists. Everything that follows in terms of the other two areas of philosophy is predicated on this view. This, we suspect, is the least controversial of our positions, but it does indeed lie behind the SFM as a non-discretionary element of our design.

Next, our earlier discussion of epistemology differentiated between theories of truth (for facts), legitimacy (for values), and evaluation (for knowledge claim evaluation), and we put forward our preferences in all three cases. Regarding truth and legitimacy, we offered the correspondence theory as our solution, relying on Hall (see Section 2.3.3), in particular, to help navigate the especially treacherous waters of value claims and value theory. Popper's theory of objective knowledge was also very helpful here (see Section 2.2.3.2). Similarly, we advocated for Popper's fallibilist theory of evaluation (i.e., Critical Rationalism) as a means for testing and evaluating competing claims against one another in the search for truth/legitimacy, and in the related construction of sustainability quotients.

Regarding the epistemological issues, in general, we must admit that while we would prefer to apply the method on the basis of the Popper/Hall philosophies we identified, they are in no way necessary as preconditions for the use of the SFM. A user could just as well subscribe to pragmatism as a theory of truth or legitimacy, and justificationism and coherence (theory) as a basis for knowledge claim evaluation, and still be able to use the SFM. In such cases, however, we would simply contend that the results obtained from the use of the SFM would be less reliable, thanks to the dubious nature of the epistemologies involved. Good people can disagree on such things.

With regard to moral philosophy, things here are much more fluid and flexible, we think. We cited, Kutz, Kant, and Rawls in our own discussion of the subject, but there are certainly many more competing moral philosophies to consider as a basis for determining what an organization's duties are to its stakeholders and society. Here we envision such alternatives coming into play as an organization tries to understand and articulate its own social contract with society. From our standpoint, the answers they provide are merely variables in the SFM.

6.3.1.6 The significance of anthro capital

The purpose of sustainability reporting, in general, is to support the process of planning for action in cases where human impacts on vital capital may be unsustainable, or are becoming so. The courses of action available to us, however, vary dramatically in the case of anthro versus natural capital. In the case of the latter, unsustainable performance means that human activity is exceeding the carrying capacity of capital, and must therefore be mitigated in some way. Our only course is to moderate or somehow change our activities, such that their effects on natural capital are less severe. We see how difficult this is to do every day now, as we constantly struggle to cope with the limits of the atmosphere to absorb our greenhouse gas emissions, or to live within the earth's diminishing capacity to satisfy our needs for fresh water.

Not so for anthro capital, however. There, things are entirely different. Whereas we cannot simply produce the reservoirs of natural capital needed to support a growing human population, we arguably can do so in the case of anthro capital. This, of course, is because anthro capital is anthropogenic. Given the will and the resources required to do so, we can almost always produce more of it. This is especially true in today's world, thanks to the enormous resources held by wealthy individuals and corporations.

What the SFM shows us, then, is that organizations can have beneficial impacts on human and social conditions in the world that are simply not possible - or are less possible - on the ecological side of the coin. Whereas we very often do not have the know-how, technology, or opportunity to mitigate our environmental impacts in the world, we absolutely do have the resources required to improve human and social conditions in places where they are deficient. In a very real

sense, the Social Footprint Method shows us the way, by making the connections between:

1. organizations with resources,
2. potentially deficient social conditions in the world, and
3. the important role that vital (anthro) capitals play in ensuring human well-being.

To be sure, the SFM is a powerful new measurement model, but our improved understanding of the beneficial effects organizations can have on the sufficiency of vital (anthro) capitals is no less significant.

6.3.1.7 The vocabulary of 'capital'

Some scholars might be critical of our decision to continue, and extend, the use of the term 'capital' in the field of sustainability, as compared to the field of economics, per se, from whence it came. Notwithstanding the argument that the field of sustainability is, in fact, part and parcel of economics, we think such criticisms tend to ignore the important sense of the term that is so vital to our thesis (i.e., that capital is a resource, or stock, that generates valuable flows of some kind). While we covered this definition of the term adequately in Chapter 3, we suspect the criticisms will persist. And so here we only wish to stress, again, that there is nothing in our use of the term that should be construed as gratuitous, or an attempt to bask, somehow, in the 'halo effect' of economics by misappropriating one of its terms. To the contrary, our use of the term is entirely genuine.

Others have confronted this issue before. In their remarks on Schultz's (1961) seminal use of the term 'human capital', Ostrom and Ahn (2003) had this to say on the same topic (p. xxv):

> "[…] we call attention to the way the concept of capital itself is transformed when human capital is considered. The concept of human capital is today accepted. In the early stage of its development, the use of capital referring to knowledge and skills embedded in humans was heavily criticized.
>
> Exactly the same thing is happening now with regard to the use of the concept of capital in 'social capital'. One does not wish to arbitrarily modify such a foundational concept as 'capital'. It is also counter-

> productive, however, to assume that the concept of capital has a fixed set of innate meanings. As knowledge grows, the denotation and connotation of a core scientific concept may change in a direction that is not purely whimsical. Conceptual development may well be productive in helping scholars understand more phenomena using a core set of conceptual tools."

We wholly agree with this statement, and are content to adhere to, and defend, our own use of the term 'anthro capital' in this thesis, under the same line of reasoning.

6.3.1.8 People feet

One of the more controversial aspects of the SFM, perhaps, is the manner in which we allocate what we call 'burden shares' to organizations, when computing sustainability performance on matters (or areas of impact, or AOIs) that involve society, in general, as the 'responsible population' for addressing the social conditions involved. Here we have taken the position that organizations are merely surrogates for the individuals who work for them, and that such allocations ought to be made, therefore, to the same individuals in accordance with their size, or number. In this regard, we think of the denominators in our quotients as being reflective of personal responsibilities, not organizational ones. This is quite intentional.

But it is also quite contrary to other, competing methods for measuring and reporting the social sustainability performance of organizations. Some make allocations on the basis of revenue, or other units of measurement that, so far as we are concerned, make no sense at all (How, after all, can we hold an inanimate, monetary unit 'responsible' for performance?). Others, including GRI, sidestep the issue completely by treating the organization as a monolithic actor, whose allocations are presumed to be the same each year, despite the fact that:

1. the organization may change in size and composition over time, and is never, therefore, the same agent or actor from one year to the next, and
2. organizations are imaginary constructions of ours, and cannot, therefore - or *should* not - be treated as if they are real people with real moral duties and obligations.

Still, GRI persists, as if the problems cited above (in Section 6.3.1.1) were insignificant or immaterial, thereby reducing the credibility of mainstream corporate sustainability reporting standards even further.

It is precisely the resolution of this problem that the People Foot metric we propose brings to the table. Here again, the SFM is advancing the science of sustainability in ways heretofore unseen, but desperately needed, so as to help make sense of how organizations with enormous resources can make helpful, but fair and proportionate, contributions towards improving human well-being on earth. If the collective sustainability performance of humans on earth is to improve, people must be willing to take responsibility for their actions in the workplace, instead of being lulled into thinking that they are somehow insulated from the effects of their actions by the corporations they work for.

It is workers, therefore, who must be invested with a greater sense of personal responsibility, and who must also, therefore, be encouraged to hold their own organizations responsible for their collective acts. But without something akin to the People Foot metric to work with, this would not be possible - and has not been possible - in a morally systematic and logically consistent way. If the SFM does nothing but succeed in raising workers' awareness and interest in the sustainability of their own joint actions - or inactions, for that matter - thanks to this simple innovation, our work will have been a great success.

6.3.2 Future directions

At this time, we see three important areas of future research for the SFM, the pursuit of which will help to enhance its value and quicken its adoption:

1. Instrumentation and indices,
2. Creating standard data sets for denominators,
3. Applying SFM metrics to socially responsible investing.

The first area of research for the SFM is the need to develop instrumentation and related indices of indicators that organizations interested in using the method can employ, without having to develop such things, themselves. Again, as a design specification or template for measuring the social sustainability performance of an organization, the SFM is not a finalized measurement model, and must be ap-

plied to specific areas of anthro capital before it can be used as such (see Appendix B).

In general, we envision one or more indices of representative indicators that would cover all three types of anthro capitals, in both an internal and external context (again, see Appendix B). This would significantly reduce the number of discrete areas that an organization would have to focus on, or measure, and at the same time would result in a set of standardized indicators that would make cross-organizational comparisons and benchmarking possible. This particular area of future research for the SFM is especially urgent, in our view, since the lack of such instrumentation and indices, and the absence of related standards, arguably inhibits its near-term or initial adoption and use.

The second area of research would logically follow the first, in the sense that the instrumentation and indices developed for the SFM would ultimately need to be grounded in real data about actual human and social conditions in the world - and continuously so, on an updated basis. For example, if an index developed as a result of the first research initiative included the need to report an organization's net contributions to alleviating poverty in the world, relative to what its contributions ought to be (i.e., relative to what the value of its denominator should be), the per capita level of such (normative) contributions would have to be known beforehand. Otherwise, the proportionate, normative levels of impacts for individual organizations could not be determined as a basis for setting the value of denominators.

Ideally, then, there would be a centralized or shared source for such data that all users of the SFM could turn to for up-to-date information about such things, much in the same way that the use of the Ecological Footprint Method is supported by the Global Footprint Network (www.footprintnetwork.org), and the databases it maintains regarding the status of natural capital in the world. That way, users of the SFM would not have to independently research the corresponding status of anthro capital in the world every time they set out to use the method.

The third area of research has enormous potential. Here we envision an application of the SFM in the institutional investment arena - although individual investors would benefit as well. At the present time, there is a plethora of so-called socially responsible investment (SRI) funds in the financial markets; these funds consist of portfolios of organizations selected for their purported sustainability,

according to one set of criteria or another. Like GRI, however, most if not all of the underlying metrics and indicators used to assemble and organize such portfolios are based on measures that arguably tell us little, if anything, about the real sustainability performance of the companies involved. This is because they are numerator-only schemes that are completely devoid of sustainability context.

What the SRI market desperately needs, therefore, is a more rigorous basis for assessing and ranking the true sustainability performance of publicly-traded companies. What is needed, in particular, is an index for doing so (i.e., a goal of our first research initiative), data standards for applying the index (the goal of our second initiative), and a research effort aimed at applying the standardized index to the analysis of publicly-traded companies on a continuing basis (our third initiative). This would result in what would arguably be the world's first bona fide sustainability index for business, the results of which could be used as a basis for making related investment decisions around the world.

The effect of such an SRI application of the SFM, of course, would be a better understanding of how companies are actually performing on a CTA-based scale. Not only would investors interested in owning shares of higher-scoring or sustainable companies be able to make more informed decisions, companies themselves would have access to the same data and would be motivated, in light of it, to improve their own performance. Over time, with this kind of market force or logic in play, the aggregated performance of whole industries and economies around the world could be pushed significantly in the direction of sustainability - an effect that today's dominant measurement models, such as GDP, have no chance of having, thanks to their systematic disregard for human impacts on, and need for, vital capitals.

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APPENDIX A

JOSEPH FIRESTONE'S FAIR CRITICAL COMPARISON THEORY

As a matter of procedure, Firestone's Fair Critical Comparison Theory (FCCT) calls for the performance of knowledge claim evaluation (KCE) in two steps. A summary of these two steps is as follows (Firestone and McElroy, 2003a, Chapter 5):

1. First, fulfilling background requirements (the necessary conditions) for fair comparison among the members of a set of competing knowledge claims;
2. Second, implementing comparisons among the members of this fair comparison set, based on a number of criteria that allow us to choose among the knowledge claims of the set based on how its members perform on various tests.

A.1 FAIR CRITICAL COMPARISON REQUIREMENTS

There are four preliminary requirements that must be fulfilled (i.e., they are normative) in setting up fair comparisons of knowledge claims:

1. equal specification of members of the comparison set,
2. continuity,
3. commensurability, and
4. completeness of the comparison set.

1. equal specification of members of the comparison set

Ensuring an equal degree of specification of competing knowledge claims is necessary for fair comparison. For example, specification of systems of knowledge claims occurs in stages. Theories often begin as highly abstract knowledge claims. Then they are specified in greater detail conceptually and then empirically specified by providing them with an interpretation in terms of 'observables'

and metrics. To compare theories fairly, it is necessary to bring them to an equal degree of specification, if they are not already there. Thus, if two or more knowledge claims are competing and one has been empirically specified with metrics and the other has not, fair comparison requires empirical specification of the second.

2. continuity

Continuity with previous versions of the knowledge claims to be compared is another requirement of fair comparison (i.e. the extent to which each alternative theory or model in a comparison set is faithful to its previous expressions). This criterion is a particularly subtle one. Theories evolve over time, they are changed and refined to meet challenges and criticism. It is easy to change a theory so much that its core identity is destroyed while its name remains the same. In situations like this, the original theory has been abandoned and is not part of current KCE. On the other hand, a theory may change substantially in its details without changing its core identity. In such instances, the theory may be fairly compared with its competitors in KCE. If we are evaluating theory A vs. theory B, then both evaluated theories must be traceable, without change of identity, to previous versions of each theory. Otherwise, the conclusion cannot be drawn that one of the theories named is preferable to the other (even though one of the theories tested may be better than the other), and the eventual consequence of such lack of continuity is destruction of the cumulative character of knowledge production.

3. commensurability

Commensurability must be created if it is not present. Commensurability refers to the extent to which alternative theories, models, or other knowledge claims may be expressed using a common conceptual framework (Popper, 1970; Kuhn, 1970a). Knowledge claims being compared must be expressed in a common conceptual framework to achieve fair comparison. This is a requirement that grows out of the debates triggered by Kuhn's work on incommensurability in the 1960s (Kuhn, 1970b; Lakatos and Musgrave, 1970), by Feyerabend's (1970a, 1970b) challenge to critical rationalism, and by the Duhem-Quine thesis (Duhem, 1954; Quine, 1953) that theories face our evaluation efforts as wholes, that all of our observations are theory-laden, and that there is no common conceptual basis on which to compare theories. The answer of Popper (1970) and other critical realists (see Niiniluoto, 1999) has been to deny incommensurability as an irresolvable condition in comparisons and, at least in the case of Popper (1970) to argue that it is always possible to create commensurability even where incommensura-

bility exists. Accepting Popper's notion that commensurability can always be constructed even when it does not initially exist, we suggest that for fair comparison to occur, commensurability must be created whenever and wherever it does not already exist.)

4. completeness of the comparison set

Completeness of the comparison set must also be sought. This refers to the extent to which the set of alternative models evaluated (the comparison set) includes all reasonable competitive alternatives. This is not a precise criterion, but rather a regulative ideal. There is no way of knowing that a comparison set is in fact complete, just as there is no way of guaranteeing that a knowledge claim is true. New models may always be formulated and older models may easily be overlooked in searches of the literature. Still, if KCE is to be fair, its comparisons of alternatives directed at solving problems must not, intentionally or through negligence, exclude models from the comparison set on ad hoc grounds or in an effort to 'stack the deck' in favor of the models or theories one prefers. Thus, a legitimate criticism of testing and evaluation involving a comparison set is that it cannot be viewed as decisive if an important competitor was excluded from the comparison set.

A.2 DIRECT COMPARATIVE KNOWLEDGE CLAIM EVALUATION CRITERIA

These criteria for fair critical comparison must be satisfied before the comparisons they produce may be considered 'fair'. The criteria include logical consistency, empirical fit, projectibility, systematic fruitfulness, heuristic quality, systematic coherence, simplicity, and pragmatic priority. These and more are briefly discussed below.

1. Logical consistency or coherence

This is a traditional criterion for testing and evaluation (Popper, 2002[1935]), and the extent to which it is present is an important variable for distinguishing and evaluating KCE processes. It provides that logical arguments in explanations be consistent, that conclusions follow from premises, and that critics have the right to bring a consistency challenge against a network of knowledge claims, but not that one's entire theoretical network be formalized.

That is, logical consistency is of special importance to us because we can isolate conclusions whose content is inconsistent with their premises. And where we find inconsistency, we can either choose to reject (falsify) the argument's conclusion (i.e., the claim) and retain its premises, or reject (falsify) one or more of its premises. Or, in cases where we agree with the conclusion and also the premises, we can retain all of them. *The point is that we can make progress and grow our knowledge when there is inconsistency, following which we are forced to falsify at least one of our premises, or failing that, the argument's conclusion.*

But in no such case as the above can we conclude that a *proof of truth* has occurred. All we can safely say is that we believe that a conclusion deductively follows from its premises or it doesn't. As Mark Notturno puts it, "The best that a logical argument can do is test the truth of a statement" (Notturno, 2001, p. 86). It "cannot force us to accept the truth of any belief," (Ibid., p. 87) because all beliefs are fallible. "But it *can* force us, if we want to avoid contradicting ourselves, to reexamine our beliefs, and to *choose* between the truth of some beliefs and the falsity of others - because the falsity of the conclusion of a valid argument is inconsistent with the truth of its premises" (Ibid.). But is this enough? Indeed it is, for as Notturno says, "so long as we regard contradictions as unacceptable, it is really quite a lot".

2. Empirical fit

The importance of this descriptor derives from the fact that it reflects the traditional empiricist requirement that deductions from models not be inconsistent with independently arrived at descriptions of the facts. If they are, logical inconsistency is incorporated into the system. This criterion is not as straightforward as it may seem, however. What if one model fits the facts better than another? Does that mean that the first model is to be favored in evaluation? Not necessarily. Sometimes, due to limitations in measurement or errors in observation, a model may be correct in its deduction of what empirical evidence should show and the measurement in question may be wrong. Alternatively, models may also be 'force fit' to data, as when too many variables are used in statistical estimation or too many nodes in a neural networking model, thus exhausting degrees of freedom of estimation. In these instances, models that fit data less closely will be the ones that will perform better on other criteria for evaluating knowledge claims.

3. Projectibility

This refers to extending generalized knowledge claims to new cases successfully (forecast validity). It has to do with plausibility of projections and after the fact

measurements of predictive success (Goodman, 1965), or survival of predictions in the face of reality. Organizations will vary greatly in the extent to which their knowledge claims are projectible, and this variance will be related to success in adaptation. Projectibility is one of the most important of normative criteria. The higher it is, the better.

4. Plausibility of projections

This is a dimension of projectibility that involves judgments. And as with *simplicity* (see below), these judgments may be derived from a group evaluation and decision process, such as the Analytic Hierarchy Process (AHP) (Saaty, 1990a, 1990b; Saaty and Vargas, 2001).

5. After the fact measurements of predictive success

This dimension of projectibility can be more 'objectively' measured by keeping a track record of empirical fit comparing competing predictions.

6. Systematic fruitfulness

This refers to the disposition to encourage deduction of new knowledge claims implicit in knowledge claims or knowledge claim networks produced by knowledge claim formulation - in other words, the extent of our ability to facilitate deduction of new knowledge claims from previous knowledge claim networks. Some networks perform better than others in giving rise to deductions of new knowledge claims implicit in the networks.

7. Heuristic quality

This refers to the disposition of knowledge claims or knowledge claim networks produced by KCE to encourage formulating new conjectural knowledge claims. Some knowledge claim networks serve as heuristics for formulating new ideas. Here again, then, we're talking about the extent of knowledge claim networks to facilitate new conjectural knowledge claims; that is, some knowledge claim networks are more successful than others in supporting future knowledge claim formulation. They serve as heuristics for formulating new ideas. Organizations will differ in the extent to which the outcomes of KCE exhibit such heuristic qualities.

8. Systematic coherence

Networks of knowledge claims may be more or less integrated by specified linguistic relationships. And organizations may vary in the extent to which their KCE processes produce such coherence. Knowledge claim networks should be systematically coherent, both in general and in the area of relationships between

abstractions and observables (measurement modeling). The effects of systematic coherence on knowledge integration and future knowledge production are not clear, though they are likely to be very significant.

9. Coherence of measurement modeling

The extent to which measures and descriptors are related through the propositions of a model's semantic network (Firestone, 1971; Firestone and Chadwick, 1972) is an aspect of systematic coherence. The connections between indicators or measures, and the abstractions they are intended to measure are frequently not clearly specified in theories (Firestone, 1971). Thus, the coherence of the semantic network in such theories is low and these theories' 'empirical deductions' about expected indicator values don't really flow from the theories' premises.

10. Simplicity

This is another traditional validation criterion. Often called 'Occam's razor,' simplicity seems to be an intuitively clear criterion, but it is difficult to rigorously formulate, as was shown some time ago (Ackermann, 1960; Goodman, 1958; Rudner, 1961). In any event, organizations will differ widely in the importance they place on simplicity in KCE. To apply this criterion normatively, the analytical structuring and subjective estimation techniques of the AHP process (Saaty, 1990a, 1990b; Saaty and Vargas, 2001) may be used to compare knowledge claims on simplicity.

11. Simplicity of mathematical form of model

The aspect of simplicity defined by the mathematical form of models is easier to assess than simplicity in linguistic expressions in general. Here, again, the AHP process […] may be used to comparatively rate different functional forms on a ratio scale of simplicity created using the AHP methodology (Saaty, 1990a, 1990b; Saaty and Vargas, 2001).

12. Economy in number of attributes or variables entering a formal model

Here again, the rule is the fewer the better, other things being equal. The aspect of simplicity called economy is relatively easy to measure since it is formulated in terms of the number of attributes used in a model.

13. Pragmatic Priority

Knowledge claim networks have descriptive and valuational aspects to them. They are networks with both descriptive and value interpretations (Firestone, 2001, 2003, Chapter 4). And they may be compared in terms of the priority val-

ues across networks of benefits resulting from actions as specified by each knowledge claim network (or theory or model). This attribute of pragmatic priority also encompasses relevance. Thus, the greater the benefit specified in a knowledge claim network, the more relevant is the network from the pragmatic standpoint of the consequences of actions in closing gaps between goal states and actual states.

When knowledge claim networks are compared according to their pragmatic priority, we are not engaging in a comparison of epistemic values, but rather one of the estimated costs and benefits specified by each network in the comparison set. In committing to the rejection of knowledge claims as false, and relying on surviving knowledge claims in actions, the risks we take are a combination of the likelihood that our evaluation rejecting particular knowledge claim networks is in error, and the benefit/cost consequences of such errors. As a result, we might suffer the consequences predicted by the true knowledge claim network we have rejected. Thus, pragmatic priority requires that epistemic criteria be weighted by the *risk of error* in developing a comparative evaluation of knowledge claims and knowledge claim networks. This criterion does not involve wishful thinking in the sense that we will value most highly those knowledge claims that predict the greatest benefits, but rather modest pessimism in that epistemic values are reduced based on the risk of error involved in not rejecting the surviving knowledge claim networks, and in rejecting their alternatives.

APPENDIX B

AN IMPACT ONTOLOGY FOR ORGANIZATIONS

B.1 INTERNAL AND EXTERNAL AREAS OF IMPACT

Below we define internal versus external areas of anthro capital that organizations can have impact on, followed by representative examples of what such individual areas of impact can consist of:

1. ***Internal Areas of Impact***
   - *Human Capital (Direct Contributions to Workers):*
     These are direct contributions to (or impacts had on) *individuals* internal to an organization, which in turn constitute personal human capital resources for its members, workers, or stakeholders.
   - *Social Capital (Contributions to Social Programs and Resources):*
     These are contributions to (or impacts had on) *programs and institutions* internal to an organization, which in turn constitute, or have impact on, shared social capital resources and services available to its members, workers, or stakeholders.
   - *Constructed Capital (Direct Contributions Within Own Enterprise):*
     These are contributions to (or impacts had on) the presence or quality of *human-made infrastructures and/or material goods* internal to an organization.
2. ***External Areas of Impact***
   - *Human Capital (Direct Contributions to Individuals in Society)*:
     These are direct contributions to (or impacts had on) *individuals* in society external to an organization, which in turn constitute personal human capital resources for such individuals.
   - *Social Capital (Contributions to Social Programs and Resources):*
     These are contributions to (or impacts had on) *third-party programs and institutions* in society external to an organization, which, in turn, constitute or have impact on social capital resources and services available to individuals and collectives in society.
   - *Constructed Capital (Direct Contributions to Social Resources):*

These are contributions to (or impacts had on) the presence or quality of *human-made infrastructures and/or material goods* in society external to an organization.

B.2 INTERNAL AREAS OF IMPACT

1. *Human capital (direct contributions to workers):*
   a. food, water, and nutrition;
   b. health;
      - via direct impacts of products and/or services when produced or applied;
   c. child care;
   d. education (individual training and personal enrichment);
   e. exercise and physical recreation;
   f. housing;
   g. material necessities;
   h. jobs at livable wage:
      - workers at own firm;
   i. justice and rule of law (actual behaviors);
   j. ethics (actual behaviors):
      - human rights,
      - labor rights,
      - anti-corruption,
      - transparency,
      - stakeholder inclusiveness,
      - gender equality and empowerment,
      - diversity,
      - work/family balance;
   k. information;
   l. safety and security:
      - enterprise level,
      - local, national, global;
   m. aesthetics;
   n. religion and spirituality.

2. *Social capital (contributions to social programs and resources):*
   a. food, water, and nutrition;

b. health:
   - via in-kind and supportive monetary means;
c. child care;
d. education (social learning and innovation);
e. exercise and physical recreation;
f. housing;
g. justice and rule of law (policies and programs);
h. ethics (policies and programs):
   - human rights,
   - labor rights,
   - anti-corruption,
   - transparency,
   - stakeholder inclusiveness,
   - gender equality and empowerment,
   - diversity,
   - work/family balance;
i. information;
j. safety and security:
   - enterprise level,
   - local, national, global;
k. aesthetics;
l. religion and spirituality.

3. Constructed capital (direct contributions within own enterprise):
a. material goods;
b. infrastructure:
   - power,
   - water,
   - sanitation,
   - roads,
   - transport services,
   - telecommunications.

B.3 EXTERNAL AREAS OF IMPACT

1. Human capital (direct contributions to individuals in society):
a. food, water, and nutrition;

b. health:
   - via in-kind and supportive monetary means,
   - via direct product and/or service impacts when consumed;
c. child care;
d. education and personal enrichment;
e. exercise and physical recreation;
f. housing;
g. material necessities;
h. jobs at livable wage;
i. ethics:
   - human rights,
   - labor rights,
   - anti-corruption,
   - transparency,
   - stakeholder inclusiveness,
   - gender equality and empowerment,
   - diversity,
   - work/family balance.

2. *Social capital (contributions to social programs and resources):*
   a. food, water, and nutrition;
   b. health:
      - via monetary means,
      - via indirect product and/or service impacts when consumed;
   c. child care;
   d. education;
   e. exercise and physical recreation;
   f. clean environment;
   g. housing;
   h. material necessities;
   i. infrastructure:
      - power,
      - water,
      - sanitation,
      - roads,
      - transport services,
      - telecommunications;
   j. jobs at livable wage:
      - workers at other firms;

k. commerce and trade:
   - impact on local/regional businesses,
   - impact on minority/women-owned businesses (MWOBs),
   - commerce with fair trade suppliers;

l. bank services and credit;

m. safety and security:
   - local,
   - national,
   - global,

n. government:
   - social services administration,
   - trade regulation;

o. justice and rule of law;

p. ethics:
   - human rights,
   - labor rights,
   - anti-corruption,
   - transparency,
   - stakeholder inclusiveness,
   - gender equality and empowerment,
   - diversity,
   - work/family balance;

q. information;

r. aesthetics;

s. religion and spirituality.

3. Constructed capital (direct contributions to social resources):

a. material goods;

b. infrastructure:
   - power,
   - water,
   - sanitation,
   - roads,
   - transport services,
   - telecommunications.

APPENDIX C

SOCIAL FOOTPRINT METHOD
FACE VALIDITY SURVEY

Synopsis of Face Validity Survey
The Social Footprint Method & Sustainability Quotients

Issued on January 27, 2008

C.1 Query 1:

Please record the extent of your agreement with the whole approach embodied in statements 1 to 10 (below).

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

C.2 Query 2:

Please evaluate each of the 10 statements below individually using the same 1-to-5 Likert scale above:

Statement 1
That the most rigorous formulations of sustainability theory and practice in the ecological domain have generally involved assessments of human impacts on the carrying capacity of natural capital (see, for example, Meadows et al, 1972; Daly and Cobb, 1989; Daly, 1996; Costanza et al 1997; and Wackernagel and Rees,

1996); natural capital can be defined as "land and the many natural resources it contains, including ecological systems, mineral deposits, and other features of the natural world" (from the Gund Institute website).

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 2

That such assessments can be structured in the form of what we call *sustainability quotients*, where the denominators represent *normative, not-to-exceed (or maximum desirable) impacts on the carrying capacity of natural capital, and the numerators represent actual impacts on the carrying capacity of natural capital.* Numerical quotient scores of less than or equal to 1.0, therefore, can be seen as signifying sustainable performance, whereas scores of greater than 1.0 can be seen as signifying unsustainable performance (i.e., due to *ecological overshoot*).

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 3

That a similar approach can be taken in the social domain, although the type of capital impacted is no longer *natural.* Instead, it is what we call *anthro* capital, a mix of human, social, and constructed (or built) capitals. Unlike natural capital, all such capitals are anthropogenic, hence the terminology we use and their grouping together.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 4

That the key issue in assessing the social sustainability performance of a human system using anthro capital is whether or not its impact contributes to the production and/or maintenance of such capitals at levels required by a population for basic well-being. Thus, instead of assessing impacts on the carrying capacity of natural capital, in social assessments we assess impacts on the carrying capacity of *anthro* capital.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 5

That anthro capital, unlike natural capital, can, in fact, be produced in order to ensure sufficient levels of supply for human well-being, and:

a. the required levels of anthro capital necessary for basic human well-being can be postulated,
b. the responsibilities, or norms, for producing and/or maintaining such capital can be proportionately assigned to individuals and their social systems (e.g., organizations) under one moral philosophy or another, and
c. the social sustainability performance of an organization, for example, can be measured and expressed in terms of its actual impacts on the carrying capacity of anthro capital, relative to what its impacts ought to be according to one such moral philosophy or another.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 6

That sustainability quotients for social sustainability performance can therefore be constructed, albeit with some important differences as compared to ecological quotients, as follows:

a. numerators and denominators both correspond to anthro capital, not natural capital,
b. denominators represent *normative, not-to-fall-below (or **minimum** desirable) impacts on the carrying capacity of anthro capital*, and the numerators represent *actual impacts on the carrying capacity of anthro capital*, and
c. the logic of scoring reverses: numerical scores of greater than or equal to 1.0 can be seen as signifying sustainable performance, and scores of less than 1.0 can be seen as signifying unsustainable performance.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 7

That all sustainability claims - both ecological and social - can be formally expressed in the form of quotients, with denominators representing normative propositions and numerators representing descriptive ones. *All sustainability claims therefore reduce to quotients of quantified **is** statements over quantified **ought** statements*.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 8

That measuring the social sustainability performance of a human social system can take the form of building social sustainability quotients, with such a *Social Footprint Method* consisting of a process for carefully defining numerators and denominators for individual areas of social impact. In this regard, the SFM is analogous to the *Ecological Footprint Method*.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 9

That the specification of descriptive numerators and normative denominators in sustainability quotients can proceed along epistemological lines, according to which competing theories of *truth* (for descriptive claims in numerators) and *legitimacy* (for normative claims in denominators) can be applied.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

Statement 10

That neither certainty nor consensus about knowledge is required in order for the science of sustainability measurement to proceed. All that is required, instead, are claims that have survived our tests and evaluations, which we, in turn, are prepared to abandon in favor of *new* claims, as errors in our thinking are revealed over time.

Put an X in the preferred box				
strongly disagree 1	disagree 2	indifferent 3	agree 4	strongly agree 5

C.3 Query 3:

On a scale of 1-to-10 (1 being lowest and 10 being highest), how would you rate your own expertise in the field of corporate sustainability management theory and practice?

Your response: _____

SAMENVATTING

(Summary in Dutch)

In dit proefschrift wordt een poging gedaan een meetinstrument te ontwikkelen waarmee de sociale duurzaamheid van organisaties gemeten kan worden. Ondanks de beschikbaarheid van verscheidene meet- en rapportagestandaarden op het gebied van duurzaamheid (zoals bijvoorbeeld de Global Reporting Initiative), wordt gesteld dat er geen methode bestaat die voldoet. De verscheidene beschikbare, gerelateerde methoden die niet voldoen, zijn stuk voor stuk ongeschikt, ofwel omdat zij sociale duurzaamheid totaal negeren, ofwel omdat zij duurzaamheid niet letterlijk meten of rapporteren.

Kortom, de belofte van het zogenaamde ‘triple bottom line’ management is nog niet gerealiseerd. Moderne managers hebben alle hulpmiddelen die zij nodig hebben om financiële en ecologische prestaties goed te kunnen besturen, maar nog niet op het gebied van sociale prestaties. Deze dissertatie dicht dit gat door een operationalisatie te geven van het ontbrekende sociale element van de ‘triple bottom line’. Het resultaat is de Sociale Voetafdruk Methode (Social Footprint Method; SFM) en het concept van duurzaamheidsquotiënten waarop deze is gebaseerd. De eerste is een meetmodel en procedure voor het bepalen van de social duurzaamheidsprestatie van een organisatie; de laatste is een breder gedefinieerd meetinstrument voor duurzaamheid, waaruit de SFM is afgeleid.

De aanpak die is gehanteerd om de SFM te ontwikkelen begint met een zoektocht naar een overtuigende interpretatie van duurzaamheid, zoals wordt weergegeven in de duurzaamheidsliteratuur en in de meest gebruikte instrumenten en methoden. De voorkeur wordt uiteindelijk gegeven aan een meet- en rapportageaanpak voor duurzaamheid, afkomstig uit het ecologische domein, genaamd de Ecologische Voetafdruk Methode (Ecological Footprint Method; EFM) en de drie gerelateerde principes van duurzaamheid die door Herman E. Daly in 1990 naar voren zijn gebracht. Daly’s principes, of regels, bestaan uit een verzameling voorwaarden waaraan een samenleving moet voldoen om duurzaam te kunnen worden genoemd:

1. Het gebruik van hernieuwbare hulpbronnen mag de regeneratiecapaciteit van de hulpbron niet overschrijden;
2. Het gebruik van niet-hernieuwbare hulpbronnen mag de ontwikkeling van hernieuwbare hulpbronnen niet overschrijden;
3. Uitstoot van afvalproducten mag de assimilatieve capaciteit van de ecologische omgeving om deze afvalstromen te absorberen niet overschrijden.

Ondanks de beperkte ecologische context van Daly's regels en het gelijke beperkte blikveld van de EFM, zijn zij richtinggevend voor hoe duurzaamheidsmeting en duurzaamheidsrapportage in het algemeen vormgegeven kunnen worden. Ten eerste wordt aangegeven dat duurzaamheid betekent dat één ding gemeten wordt in termen van een ander - in termen van impacts op hulpbronnen tegen prestatiestandaarden voor wat deze impacts zouden moeten zijn. Vervolgens blijkt uit de literatuur dat de specifieke hulpbron, indien de ecologische duurzaamheid van menselijk handelen wordt bepaald, een soort van kapitaal is - natuurlijk kapitaal.

Gewapend met deze inzichten, wordt een poging gedaan om vast te stellen of een instrument waarmee sociale duurzaamheid gemeten en gerapporteerd kan worden al dan niet gemaakt kan worden volgens dezelfde basisprincipes die voor ecologische duurzaamheid gelden. Deze poging is succesvol. Het belang en de relevantie van kapitaal - elke vorm van kapitaal - is dat deze dient als een elementaire bron voor menselijke welzijn. Inderdaad, kapitaal kan worden gezien als een verzameling van alles dat een stroom van waardevolle goederen of diensten voortbrengt, die mensen op hun beurt regelmatig gebruiken of geschikt maken om in hun welzijn te voorzien. De kwaliteit van deze stromen en de mate waarin zijn kunnen voorzien in goederen en diensten worden aangeduid met de term draagvermogen of 'carrying capacity'. Duurzaamheidsprestatie verwordt vanuit dit perspectief tot een meting van effect op het draagvermogen van elementaire kapitalen, relatief ten opzichte van wat deze effecten zouden behoren te zijn om menselijk welzijn te kunnen garanderen.

Als echter in het geval van de ecologische bottom line - zoals bij de EFM, Daly's wetten, etc. - het relevante kapitaal natuurlijk kapitaal is, wat is dan het relevante kapitaal in relatie tot de sociale bottom line? Hier wordt gesteld dat er eigenlijk drie van dit soort kapitalen zijn: menselijk kapitaal, sociaal kapitaal en geconstrueerd kapitaal. Verder wordt opgemerkt dat in tegenstelling tot natuurlijk kapitaal, deze drie kapitaalsoorten volledig antropogeen zijn - zij zijn het product van

mensen. Met andere woorden, men kan deze drie kapitalen gezamenlijk benoemen als antro-kapitaal.

Vervolgens wordt aandacht besteed aan het feit dat de algemene benadering in deze dissertatie van het meten van duurzaamheid is gebaseerd op de systematische formulering van drie typen beweringen: twee beschrijvende en één normatieve bewering. Duurzaamheidsmeting en duurzaamheidsrapportage hebben altijd te maken met, één, het formuleren van een beschrijvende bewering van wat de effecten van een organisatie op elementaire kapitalen zijn geweest; twee, een normatieve bewering van wat deze effecten hadden moeten zijn geweest; en drie, nogmaals een descriptieve bewering over hoe de eerste twee beweringen in verhouding tot elkaar staan. Voor zover deze derde bewering betreft, zijn de effecten van een organisatie op elementaire kapitalen consistent met de corresponderende normatieve bewering, of zijn deze dat niet. Als zij consistent zijn, wordt het gemeten gedrag duurzaam bevonden; als zij niet consistent zijn, is het gedrag niet duurzaam.

Figuur S.1 De duurzaamheidsquotiënt

$$S = A/N$$

waarbij:

S = duurzaamheidsprestatie (een descriptieve bewering)
A = werkelijke effect op het draagvermogen van het elementaire kapitaal (een descriptieve bewering)
N = normatieve effect op het draagvermogen van het elementaire kapitaal (een normatieve bewering)

De relatie tussen de drie hierboven genoemde beweringen, kunnen uitgedrukt worden in een vergelijking, waarin een duurzaamheidsquotiënt (A / N) wordt bepaald in Figuur S.1.

Hiermee is in zekere zin het epistemologische karakter van duurzaamheidsmeting en duurzaamheidsrapportage effectief vastgesteld. Vervolgens is een geheel hoofdstuk gewijd aan de studie van gerelateerde waarheidstheorieën, waardetheorieën en de basis verschillen tussen descriptieve en normatieve beweringen. Van hieruit is een epistemologische basis gekozen om verder mee te gaan, waarbij er vanuit wordt gegaan dat zowel feitelijke (i.e. descriptief) en normatieve beweringen op niet-relativistische wijze gemaakt kunnen worden, overeenkomstig een

correspondentietheorie van waarheid, maar nooit met zekerheid. Hierbij wordt fallibilisme omarmd en in het bijzonder de epistemologie van Karl Popper. Zodoende wordt gesteld dat iemand prestatiestandaarden kan vaststellen, of normatieve beweringen, om duurzaamheid te realiseren die zijn gebaseerd op het idee van het in stand houden van menselijk welzijn en dat losstaande descriptieve beweringen over of deze standaarden al dan niet zijn behaald kunnen ook worden geformuleerd. En dit alles kan gedaan worden op een epistemologische gefundeerde en legitieme wijze.

De details van het meetmodel dat wordt voorgesteld voor het bepalen van de sociale duurzaamheidprestatie van een organisatie worden vervolgens uitgewerkt in de vorm van een sociaal quotiënt, een variant op de bredere, eerder gedefinieerde duurzaamheidsquotiënt (A/N) in Figuur S.2.

Figuur S.2 Sociale duurzaamheidsquotiënt

$$\text{duurzaamheids prestatie} = \frac{\text{netto actuele effect op draagvermogen van antrokapitaal als resultaat van organisatie activiteiten}}{\text{netto normatieve effect op draagvermogen van antrokapitaal als resultaat van organisatie activiteiten}}$$

Vervolgens wordt gesteld van de sociale duurzaamheidsprestatie van een organisatie bepaald kan worden door gebruik te maken van de sociale quotiënt, zoals hierboven is gegeven, op ofwel een interne of een externe basis. Interne prestatie zal over het algemeen effecten betreffen op elementaire antro-kapitalen die van belang zijn voor het welzijn van medewerkers; externe prestatie daarentegen zal betrekking hebben op effecten op belanghebbenden die zich buiten een organisatie bevinden - normaliter op een lokaal, regionaal, nationaal, of internationaal niveau. Om zulk soort metingen te ondersteunen wordt een interne-versus-externe ontologie gegeven van situaties in de wereld die corresponderen met menselijke behoeften en welzijn en die correleren met ondersteunende soorten antrokapitaal.

Opvolgend wordt aandacht gegeven aan de procedurele kan van de SFM. Omdat de SFM de constructie en het gebruik van quotiënten betreft, wordt de voorgestelde procedure als volgt uitgedrukt:

Stap 1: Definieer de systeemgrenzen van de analyse;
Stap 2: Selecteer specifiek(e) effectgebied(en) (Areas Of Impact; AOI's);
Stap 3: Specificeer en construeer de noemer van het quotiënt;
Stap 4: Specificeer en construeer de teller van het quotiënt;
Stap 5: Bereken de quotiëntscore.

Gebruikers van de SFM moeten in eerste instantie op de hoogte zijn van de systeemgrenzen van hun analyse. Er wordt een onderscheid gemaakt tussen organisationele, fysieke en tijdelijke domeinen. Vervolgens wordt gesteld dat specifieke effectgebieden geselecteerd moeten worden die worden bestudeerd, omdat met elk effectgebied een unieke duurzaamheidsquotiënt verbonden kan zijn. Daarna wordt aandacht geschonken aan de constructie van de quotiënten zelf, beginnend met de noemers en dan de tellers. Tenslotte volgt de berekening en analyse van de gerelateerde scores.

Om het gebruik van de SFM te illustreren, worden twee gevalsstudies besproken - één betreft een onderdeel van het Unilever concern in de V.S., te weten Ben & Jerry's Homemade, Inc. en de andere, Wal-Mart Stores, Inc. De Ben & Jerry's gevalsstudie betreft een meting van de bijdrage van de organisatie aan de productie en/of het onderhoud van antro-kapitaal op het niveau dat nodig is om een bijdrage te kunnen leveren aan het tegengaan van de negatieve effecten van klimaatsverandering. De Wal-Mart gevalsstudie daarentegen is gericht op de bijdragen die gemaakt worden ten aanzien van het bereiken van de VN Millennium Ontwikkeling Doelstellingen. In beide gevalsstudies wordt prestatie gemeten ten opzichte van een allocatie van het proportionele aandeel van het bedrijf van wat hun prestatie zou moeten zijn geweest (i.e. zoals weergegeven in de normatieve beweringen die vertaald zijn in de noemers van hun respectievelijke quotiënten).

Het laatste hoofdstuk geeft een samenvatting van de belangrijke conclusies, waaronder de volgende:

1. Huidige leidende instrumenten en methoden voor het meten en rapporteren van duurzaamheidsprestatie in organisaties maken hun belofte niet waar en meten en rapporten duurzaamheidsprestatie geenszins op een betekenisvolle en letterlijke wijze;
2. Sommige instrumenten echter, zoals de Ecologische Voetafdruk Methode (EFM) zijn effectiever, dankzij de inclusie van de duurzaamheidscontext in hun meetbereik; duurzaamheidscontext kan worden gezien als een

weergave van elementaire kapitalen in de wereld en de corresponderende toestand van menselijk welzijn;
3. Organisationele duurzaamheidsprestatie kan daarom het beste begrepen worden als een meting van effecten op elementaire kapitalen, waarvan de kwaliteit en productie variabelen vormen in menselijk welzijn;
4. Er zijn geen instrumenten of methoden die letterlijk de sociale duurzaamheidsprestatie van organisatie kunnen meten en rapporteren; zo'n methode kan echter wel gemaakt worden door uit te gaan van de op kapitaal gebaseerde benadering die aangetroffen wordt in de EFM en gelijkende instrumenten. De Sociale Voetafdruk Methode (SFM) is zo'n oplossing, alhoewel er verschillende (antro-)kapitalen in de mix gebruikt worden.

Deze dissertatie eindigt met een discussie over verschillende, belangrijke vragen die opgeworpen worden door de SFM en een aantal ideeën en mogelijkheden waar verder onderzoek op gericht kan worden. Met name betreft dit de noodzaak voor een op index gebaseerde SFM en sommige gespecialiseerde applicaties in de arena van het sociaal verantwoord investeren (SRI).

SUMMARY

In this thesis, an effort is made to develop a means of measuring the social sustainability performance of organizations. It is suggested that despite the availability of several sustainability measurement and reporting standards (e.g., the Global Reporting Initiative), no such satisfactory method currently exists. Of the various related, and unsatisfactory, methods that do exist, they are each inadequate, either because of their failure to address social sustainability at all, or because they do not measure and report sustainability in any sort of literal way.

Thus, a conclusion is made that the promise of so-called triple bottom line management has not yet been fulfilled. Modern-day managers have all of the tools they need to do a proper job of managing financial and environmental performance, but not yet their social performance. This thesis sets out to close that gap by operationalizing the missing social element of the triple bottom line. The result is the Social Footprint Method (SFM), and the concept of sustainability quotients upon which it rests. The former is a measurement model and procedure for determining the social sustainability performance of an organization; the latter is a more broadly defined sustainability measurement model, from which the SFM is derived.

The approach taken to developing the SFM begins with a search for a compelling and persuasive interpretation of sustainability, as reflected in the sustainability literature and also in mainstream tools and methods currently in use. Preference is ultimately given to a sustainability measurement and reporting approach found in the environmental domain, exemplified by the Ecological Footprint Method (EFM), and three related principles of sustainability put forward in 1990 by Herman E. Daly. Daly's principles, or rules, comprise a set of conditions that must be met by a society in order for sustainability to obtain:

1. Its rates of use of renewable resources do not exceed their (the resources') rates of regeneration;
2. Its rates of use of non-renewable resources do not exceed the rate at which alternative renewable resources are developed;

3. Its rates of pollution emissions do not exceed the rate of the environment's assimilative capacity to absorb such emissions.

Despite the narrowly ecological context of Daly's rules, and the equally narrow scope of the EFM, both are instructional in terms of how sustainability measurement and reporting, in general, can be approached. It is first observed that sustainability entails the measurement of one thing in terms of another - of impacts on resources against *standards of performance* for what such impacts ought to be. It is then observed, from a closer inspection of the literature, that the particular resource of interest when assessing the ecological sustainability of human activity is a type of capital - natural capital.

Armed with these insights, an effort is then made to determine whether or not a social sustainability measurement and reporting method can be devised according to the same basic principles found on the ecological side of the subject. This effort is successful. The importance and relevance of capital - *all* capital - is that it serves as a vital resource for human well-being. Indeed, capital can be defined as a stock of anything that yields a flow of valuable goods or services, which humans, in turn, regularly use or appropriate in order to maintain their well-being. The quality and/or sufficiency of such flows can be referred to as their *carrying capacity*. Sustainability performance thereby reduces to a measurement of impacts on the carrying capacity of vital capitals, relative to what such impacts ought to be in order to ensure human well-being.

If, however, in the case of the environmental bottom line - per the EFM, Daly's rules, etc. - the relevant capital of interest is natural capital, what is the relevant capital of interest where the social bottom line is concerned? Here it is determined that there are actually three such capitals: human capital, social capital, and constructed capital. It is further observed that unlike natural capital, these three types of capital are entirely anthropogenic - humans produce them. Thus, one can refer to them collectively as *anthro capital*.

Notice is then given to the fact that the general approach to sustainability measurement favored in this thesis involves the systematic formulation of three types of claims: two descriptive claims and one normative claim. Sustainability measurement and reporting, that is, always involves, first, the making of a *descriptive* claim about what an organization's impacts on vital capitals have been; then second, a *normative* claim is made about what such impacts *ought to* have been;

and third, another descriptive claim is made about how the first two claims compare. Insofar as the third claim is concerned, an organization's impacts on vital capital are either consistent with the corresponding normative claim, or they are not. If they are consistent, the behaviors measured are said to be sustainable; if they are *not* consistent, the behaviors are unsustainable.

The relationship between the three claims discussed above can be expressed in the form of an equation, in which a sustainability quotient (A/N) can be configured as shown in Figure Se.1.

Figure Se.1 The sustainabilty quotient

$$S = A/N$$

where:

S = sustainabilty performance (a descriptive claim)
A = actual impacts on the carrying capacities of vital capitals (a descriptive claim)
N = normative impacts on the carrying capacities of vital capitals (a normative claim)

Having effectively discovered, in a sense, the epistemological nature of sustainability measurement and reporting, an entire chapter is devoted to the study of related theories of truth, value theory, and the basic differences between descriptive and normative claims. An epistemological basis for moving ahead is then chosen, according to which it is claimed that both factual (i.e., descriptive) and normative claims can be made in a non-relativistic fashion, in accordance with a correspondence theory of truth, but never with certainty. At this juncture, fallibilism is embraced and, in particular, the epistemology of Karl Popper. Thus, it is asserted that one can formulate standards of performance, or normative claims, for achieving sustainability that are grounded in the idea of maintaining human well-being, and that separate descriptive claims about whether or not such standards have been met can also be formulated. And all of that, it is argued, can be done in an epistemologically sound and legitimate fashion.

The specifics of the measurement model proposed for determining the social sustainability performance of an organization are then fleshed out in the form of a *societal quotient*, a variant of the more broadly defined sustainability quotient earlier identified (A/N) (see Figure Se.2).

Figure Se.2 Sustainability quotients for social impacts

$$\text{social sustainabitilty performance} = \frac{\text{net actual impact on carrying capacity of anthro capital resulting from organizational operations}}{\text{net normative impact on carrying capacity of anthro capital resulting from organizational operations}}$$

Next it is claimed that the social sustainability performance of an organization can be assessed using the societal quotient construct above, on either an internal or an external basis. Internal performance will generally involve impacts on vital anthro capitals of importance to the well-being of employees; external performance, by contrast, will involve impacts on stakeholders outside of an organization - usually at a local, regional, national, or global level. To support such assessments, an internal-versus-external ontology of conditions in the world that correspond to human needs and well-being is provided, and correlated with supporting types of anthro capital.

Attention is then given to the procedural side of the SFM. Since the SFM involves the construction and use of quotients, the procedure proposed is expressed, accordingly:

Step 1: Define boundaries of analysis;
Step 2: Select specific area(s) of impact (AOIs);
Step 3: Specify and construct denominator;
Step 4: Specify and construct numerator;
Step 5: Compute the quotient score.

Users of the SFM must first be clear about the boundaries of their analysis. Here a distinction is made between organizational, physical, and temporal domains. Next it is argued that specific areas of impact must be selected for study, since each may have a unique sustainability quotient associated with it. Attention is then given to the construction of the quotients themselves, starting with the denominators, and then the numerators. Last comes the computation and analysis of related scores.

To help illustrate use of the SFM, two case studies are provided - one involving a subsidiary of the Unilever Corporation in the U.S., Ben & Jerry's Homemade, Inc., and the other, Wal-Mart Stores, Inc. The Ben & Jerry's case involves a measure of the company's contributions towards producing and/or maintaining anthro capital at levels required to effectively address climate change mitigation. The Wal-Mart case, by contrast, focuses on contributions made towards helping to achieve the UN's Millennium Development Goals. In both cases, performance is measured against a computation of what the companies' impacts ought to have been, in order for their performance to be regarded as sustainable (i.e., as reflected in the normative claims embodied in the denominators of their respective quotients).

The final chapter provides a summary of several important conclusions, including the following:

1. Leading tools and methods used to measure and report sustainability performance in organizations today fail to function as advertised, and do not measure and report sustainability performance in any meaningful, or literal, way;
2. Some tools, however, such as the Ecological Footprint Method (EFM), are more effective, thanks to their inclusion of sustainability context in their scope. Sustainability context can be understood as an account of vital capitals in the world, and the corresponding state of human well-being;
3. Organizational sustainability performance is best thought of, therefore, as a measure of impacts on the stocks and flows of vital capitals, the quality and supply of which are determinants of human well-being;
4. There are no tools or methods for measuring and reporting the social sustainability performance of an organization in a literal sense; such a method can be devised, however, using the capital-based approach found in the EFM and tools like it. The Social Footprint Method (SFM) is one such solution, albeit with different (anthro) capitals involved in the mix.

The thesis ends with a discussion of several key issues raised by the SFM, and some ideas and opportunities for where the research might go from here. Of particular importance is the need for an index based on the SFM, and some specialized applications in the socially responsible investment (SRI) arena.