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# The Development of a Composite Sustainable Development Indicator for a Corporate Retail Enterprise

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Dissertation Submitted in Partial Fulfilment of the Degree:

Master of Philosophy in Environmental Management

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December 2006

## **Abstract**

This dissertation proposes a conceptual and methodological framework for the creation and implementation of a Composite Sustainable Development Indicator for a retail corporate entity. It provides a review and evaluation of existing approaches to sustainability development, and in particular Corporate Sustainability. The study selects and combines aspects of existing conceptual frameworks into a new conceptual framework for a Composite Sustainable Development Indicator for the retail context. It then applies this framework and general principles and criteria of sustainability assessment, in the selection and adaptation of an existing CSDI framework, namely the Barometer of Sustainability. An illustrative example of the application of the proposed methodological framework is also provided.

The study was initiated based on the need for more research into the complexity of Composite Sustainability Indicators. The study also attempts to address the lack of effective methodologies for assessing, measuring and managing sustainability within a corporate environment. It thus proposes a more rigorous approach to sustainability that may enhance the current culture of reporting.

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## LIST OF ACRONYMS

BEE	Black Economic Empowerment
BOS	Barometer of Sustainability
CSDI	Composite Sustainable Development Indicator
CSR	Corporate Social Responsibility
EF	Ecological Footprint
EMS	Environmental Management Systems
ESI	Environmental Sustainability Index
GDP	Gross Domestic Product
GRI	Global Reporting Initiative
HDI	Human Development Index
ICLEI	International Council for Local Environmental Initiatives
IUCN	International Union for the Conservation of Natural Resources
JSE	Johannesburg Stock Exchange
NEMA	National Environmental Management Act
NEPA	National Environmental Policy Act
OECD	Organisation for Economic Co-operation and Development
SMS	Sustainable Management System
UNCED	United Nations Conference on Environment and Development
UNDP	United Nations Development Program
UNEP	United Nations Environmental Programme
UNEPGC	United Nations Environmental Programme's Governing Council
WBCSD	World Business Council for Sustainable Development
WCED	World Commission on Environment and Development
WDI	Well-Being Development Index
WON	Well-Being of Nations
WSSD	World Summit on Sustainable Development
WWF	World Wildlife Fund (WWF)

## ACKNOWLEDGEMENTS

The authors of this report would like to thank Dorothy McLaren from the Corporate Governance Department of Woolworths and Nic Rockey from Trialogue for allowing us the opportunity to assist them in developing a Sustainability Index for the Woolworths Enterprise. We all learnt an immeasurable amount and are very sure that the experience will stand us in good stead in the future. We are also very grateful to Professor Richard Fuggle and Dr Richard Hill for their academic guidance and supervision throughout the process. Last but not least, thank you to our respective families for their ongoing and unconditional support.

# Chapter 1

## 1. Introduction

“The time has come to break out of past patterns. Attempts to maintain social and ecological stability through old approaches to development and environmental protection will increase instability. Security must be sought through changes.’

(WCED 1987, p309)

There was overwhelming evidence during the last half of the twentieth century that the great self-balancing system of nature was becoming increasingly unbalanced (e.g. Osborn, 1953; Carson, 1962; Meadows *et al.* 1972; Ward and Dubos, 1972; Schumacher, 1973). Schumacher cautioned in his book *Small is Beautiful* that the condition of unbalance could move from specific points to the more generalized through the continued increase in human consumption. Since this publication, it is clear that consumption rates have continued to increase and the generalized unbalancing of the earth's ecosystems has become more evident.

This awareness of the environmental constraints to human development catalysed a growing concern for humanity's development impacts and initiated a move towards exploring more sustainable solutions. The term 'sustainable development' was popularised by the World Commission on Environment and Development (WCED) in its 1987 report entitled *Our Common Future*. Numerous academics have debated the concept of sustainable development since its conception (for example: Redclift, 1987; Meadows *et al.* 1992; Wackernagel and Rees, 1996; Baker *et al.* 1997; Mebratu, 1998; Beddington, 2001), while many governments, non-government organisations (NGO's) and international organisations have attempted to convert the theoretical intentions of sustainable development into practice (Ko, 2005).

The prosperity attained in some parts of the world is often precarious, as it has been secured through practices that bring profit and progress only over the short term (WCED, 1987). This has led to numerous United Nations Conferences calling for private enterprise to assume greater responsibility for human development (Gladwin *et al.* 1995). In the last century, business has become one of the most powerful institutions on

the planet and the dominant institution in any society needs to take responsibility for the whole (Gladwin *et al.* 1995). Gladwin concludes that business is one of the key mechanisms on the planet today that is powerful enough to produce the changes necessary to reverse global environmental and social degradation. Interest in the relationship between business and the environment grew significantly during the second half of the 1980s (Ulhoi *et al.* 1996). An ever-increasing number of companies recognise the importance of sustainable development and are beginning to devote more attention to environmental and social issues (Daub, 2005).

The subject of this dissertation falls within the ambit of sustainable development, and, more specifically, Corporate Sustainability. It attempts to adapt a tool, called the Barometer of Sustainability, to create a Composite Sustainable Development Indicator Framework (CSDI) aimed specifically at retail organisations.

## 1.1 Aims and Objectives

This dissertation aims to adapt the underlying framework and principles of the Barometer of Sustainability to the corporate environment to help communicate the extent to which an organisation's activities are contributing to, or detracting from, their sustainable development goals.

The main objectives of this dissertation are to:

- Develop a logical and coherent argument from the broad theoretical underpinnings of key sustainability concepts through to specific sustainability issues aimed directly at retail organisations.
- Adapt the Barometer of Sustainability from its current focus at regional and national levels, to the corporate organisational level.
- Develop a practical Composite Sustainable Development Indicator (CSDI) Framework and operational model that is both theoretically sound and practically applicable within a retail context.

## 1.2 Dissertation Structure

The following information is presented for readers wishing to gain an overview of this dissertation.

**Chapter 2** provides a background to the dissertation and places it within the wider context of implementing an SMS within an organisation. It briefly introduces the broad steps that were taken during the implementation of the SMS and motivates the need for adapting a generic Composite Sustainable Development Indicator Framework (CSDI) to speak practically and effectively in a corporate context.

**Chapter 3** introduces the concept of sustainable development and explores its development from its conception at the World Commission on Environment and Development in 1980. It further explores the idea of the sustainability continuum before introducing its emergence within the corporate environment.

**Chapter 4** begins by unpacking the variety of different approaches that businesses have taken to address the notion of sustainable development and adapting it to the corporate environment. It provides the basis for evaluating what corporate sustainability actually means before focussing more specifically on how it applies to the retail sector.

**Chapter 5** introduces the need for Composite Sustainability Development Indicators and summarises a number of different approaches taken to assessing sustainability and representing sustainability information. It discusses and critically assesses different frameworks and attempts to legitimise which theoretical frameworks and which CSDI frameworks could best be adapted to a retail context.

**Chapter 6** provides a wider expression of the origins and background of the measurement tool that has been selected, namely the Barometer of Sustainability. It introduces the basic methodological principles for a CSDI framework.

**Chapter 7** outlines the adaptive process and the methodological adaptations that have been applied in creating a new Composite Sustainable Development Indicator.

**Chapter 8** provides a detailed case study, which directly employs the specific methods adapted from the Barometer of Sustainability.

**Chapter 9** outlines the entire methodological process for a user group to follow, providing an overview of the methodology of this thesis

**Chapter 10** provides the conclusion of this dissertation in which the major arguments of each chapter are summarised

This chapter has introduced the aim, objectives, methodology, and structure of this dissertation. Before introducing the concept of sustainable development, a brief introduction to the contextual setting of this study is provided.

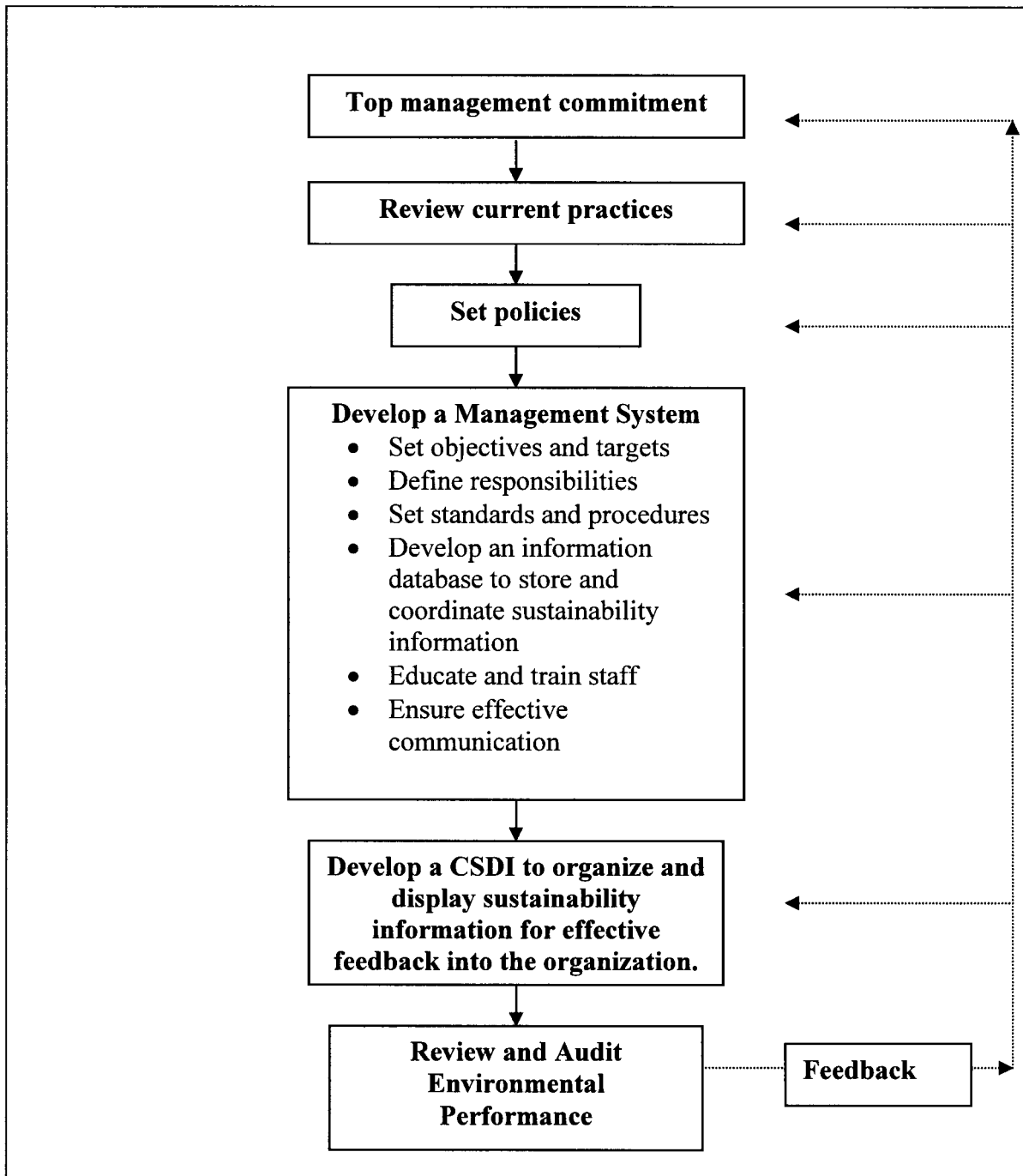
# Chapter 2

## 2. Background Context

This chapter defines matters of a general background character in order to formulate a clear understanding of the conception, orientation and content of this dissertation.

This dissertation was motivated through ongoing work with a retail organization and a need to find a solution to effectively organize and display sustainability information in a practical yet theoretically sound manner. It became evident during the construction and implementation of a Sustainability Management System (SMS) that there was a gap between the collecting and archiving of relevant sustainability information and its effective feedback into the organization.

An SMS is a derivation of an Environmental Management System (EMS) and provides a framework for an organization to move beyond purely reporting on sustainability issues and actually embedding sustainability thinking, practices and targets into its core strategy. The ISO 14001 defines an EMS as the part of the overall management system that includes organizational structure, planning activities, responsibilities, practices, procedures, processes and resources for developing, implementing, achieving, reviewing and maintaining the environmental policy (Clements, 1996). In this dissertation, an SMS is a term used to describe an EMS that focuses on the management of all issues within the ambit of sustainability rather than purely on environmental issues. An SMS addresses the broader sustainability issues in a similar way to the way in which the ISO 14001 EMS standard deals with environmental issues (McDonald, 2005). An EMS is therefore a system that manages the planning, implementation, collection, review and feedback of environmental information into an organisation. The main focus of this dissertation is on the organization, display and feedback of sustainability information into the larger management structure of an SMS. This organization, display and graphical feedback can be done through the use of a Composite Sustainable Development Indicator CSDI (see Figure 1. for a graphical explanation).



**Fig. 1.** Structure of an SMS (Adapted from Soutter and Mohr, 1993)

It is important to note that this body of work is motivated by an organizational need but has been written completely independently of any organizational involvement and as objectively as possible. It is also important to note that this study has received no

financial aid nor been guided by any specific deliverables for any organization. It has been written with the objective of finding a practical and applicable reporting output on sustainability issues from a corporate perspective. It will draw upon the authors' practical experience with implementing an SMS within a retail company but relies on a sound theoretical framework and specific research into sustainability issues.

An SMS provides a systematic management framework in which sustainability decisions can be made. It helps an organization focus on the development of organizational structures that clearly define the roles and responsibilities of all parties and establishes lines of communication to improve the overall management of the process (Hill, 2003). This particular SMS is based on the principle of continual improvement from the International Organisation for Standardisation (e.g. Standard ISO14001), an internationally recognized standard for Environmental Management Systems. The rationale behind the principle of continual improvement is to ensure that an organization sets itself a number of achievable goals that are continually redefined to ensure that it continually moves toward becoming a more sustainable enterprise. An SMS is therefore a tool to help companies systematically identify measure and manage their sustainability objectives and goals.

The implementation of a sustainable development framework requires a number of iterative steps and procedures over time to handle the many uncertainties, interdependencies and tradeoffs that arise during its development. Translating a sustainability strategy into action and driving it through a complex organization is a substantial challenge and requires a strong commitment throughout the organization (Epstein and Roy, 2001).

The next section will outline the background context to this study and its temporal context. It is important to note that there are many different approaches and methodologies to implementing a sustainability initiative and the following methodology is just one of many approaches that could be used to operationalise an organization's sustainability objectives and goals. Different methodologies are likely to suite different organizations and an important success factor to ensuring that a sustainability initiative is implemented properly is making sure that the right methodology is chosen to meet the objectives and goals of an organization.

## 2.1 A Practical Guide to Implementing a Sustainability Management System (SMS)

### 2.1.1 Commitment

For sustainability to take root within an organization, it is important that the sustainability issues and overarching goals of a sustainability initiative are understood and the proper commitment is given at board, executive and management levels. The initial phase of a sustainability initiative consists of setting up a sustainability index consisting of a series of organisation wide indicators that aim to manage and measure the performance of an organisation in relation to a range of social, environmental, economic and institutional sustainability issues.

The definitions of sustainable development used in assessments are most often pillar based and the common triple-bottom-line approach should be seen as the minimum requirement to sustainability assessments (Pope *et al.* 2004). This dissertation has chosen a four-pillared approach to assessing sustainability so as to include the institutional dimension and ensure a holistic approach is taken with respect to sustainability. The four-pillared approach will be discussed further in chapter 3 and 5. The four pillars used in this dissertation are:

- Environment
- Social
- Economic
- Institutional

### 2.1.2 Policy Construction and the creation of a Management System

A sustainability initiative is best constructed through the process of mutual adjustment. Mutual adjustment involves bargaining and adjustment between various interest groups and involves a mixture of limited analysis and social interaction (Hill unpublished, 2004). Ongoing consultation with and between the different departments of an organization is an important requirement for determining the capabilities of each department to implement and monitor sustainability issues.

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Data collection should be done on an iterative basis to ensure that all issues receive adequate attention and new developments can be fed back into the construction of the SMS. A strategic response to implementing a sustainability initiative requires knowledge of where an organization is, where it is going and where it wants to be (Piasecki *et al.* 1999). This initial phase aims to find answers to these fundamental questions to ensure that the sustainability initiative worked within the goals, aims and focus of an organization.

Each Pillar, for example the environment, can be broken down into a number of sub-items such as waste management, energy usage, water usage and biodiversity. Each of these sub issues should be guided by a specific policy, management strategy and measurable indicator to ensure that each issue was guided by a policy, implemented by a management strategy and measured through a relevant sustainability indicator (see table below).

**Table 1.** Deconstruction of the Sustainability Dimension.

<b>Sustainability Dimension</b>	<b>Sub-issues</b>	<b>Policy</b>	<b>Management Strategy</b>	<b>Sustainability Indicator</b>
Environment	Energy Conservation	Specific energy usage policy	Adoption of procedures and audit initiatives to ensure the energy is applied	1. Statistics relating to energy usage within the business 2. % of stores with energy saving devices

An example of how each sustainability issue was broken down to ensure it was properly managed. The example shows that each sub-issue could have more than one indicator depending on the type of sustainability issue being measured.

Direct input should be encouraged from the individuals who will ultimately become responsible for implementing, managing and reporting on sustainability issues. The evaluation process should be undertaken by project stakeholders and not just by the specialists involved so that stakeholders can apply their values and attempt to make trade-offs between their various preferences (Adapted from Hill, unpublished, 2004).

### 2.1.2.1 Set standards and procedures

An effective way of pinpointing key sustainability indicators within a business is to map them graphically. Managers, sustainability specialists and all the relevant stakeholders involved in a sustainability initiative would need to decide on those indicators with the highest sustainability impact and would be the easiest to implement. It is important to note that this step is not a set requirement of an SMS but the authors' felt it was a practical way of ensuring sustainability issues were operationalised early on. A practical method could be to score each sustainability issue (see Table 2).

**Table 2.** A scoring system could be used to determine an indicator's ease of implementation and sustainability impact.

<b>Ease on implementation</b>	<b>Sustainability Impact</b>
1 – difficult	1 – low
2 – moderately difficult	2 – moderate low
3 – moderate	3 – moderate
4 – moderately easy	4 - moderately high
5 – easy	5 – high

The end result is a graphical representation of all the relevant indicators depending on their sustainability impact and ease of implementation scores (see Table 3).

**Table 3.** Ease of implementation ratings

<b>Ease of Implementation</b>	<b>5</b>					Indicator 13,14,17
	<b>4</b>				Indicator 4,7	
	<b>3</b>					
	<b>2</b>	Indicator 2				
	<b>1</b>					
	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b>
	<b>Sustainability Impact</b>					

Table 3 shows a graphical representation of how each indicator was mapped according to its ease of implementation and sustainability impact. Indicators were given numbers to make it easier to represent them graphically. For example indicators 13, 14 and 17 would all have had a high sustainability impact while being easy to implement, while indicator 2 had a low sustainability impact and would require significant effort to implement within the organization.

**2.1.2.2 Define Responsibilities**

Each indicator should be ‘owned’ by a manager who is responsible for that particular indicator or who had the best knowledge, experience and capabilities to implement it into the business. This process ensures that self-selected managers become accountable for meeting agreed upon targets and ensure the organization is moving towards conducting their business in a more sustainable manner.

Those sustainability issues that were both easy to implement and had a high sustainability impact were highlighted as key sustainability issues and given priority with respect to implementation within the business. This practical approach is an effective way to encourage corporate organisations to begin implementing sustainability initiatives early on without increasing their financial risk. It should be noted however that sustainability issues that are not within this ‘high priority’ category are no less important, but will generally require longer timelines and larger financial commitments.

### **2.1.2.3 Population of the database**

An organizational wide commitment is required to efficiently populate the information database with what is currently being done on each sustainability issue. It forms an important step in understanding the *status quo* and provides a platform to begin setting targets to report against. An electronic database should be used for the storage and management of sustainability related information. This allows for information to be accessed easily and updated continuously.

Summary reports on each department's sustainability position provide an important benchmark from which to set goals and targets. This process ensures each department aware is aware of its current performance in relation to the organizations sustainability goals.

The process, in summation, enables an organization to develop a central SMS to ensure the proper management and monitoring of sustainability issues throughout the organization.

The next section outlines the evolution of the concept of sustainable development and the inherent difficulties of operationalising this concept in a practical manner. It is important to note that the term sustainable development and sustainability have been used interchangeably within the context of this dissertation.

# Chapter 3

## 3. Sustainable Development

### 3.1 Introduction

This chapter outlines the development of the concept of sustainable development, highlighting key authors and events that led to the perpetuation of key ideas that relate to sustainable development and sustainability. It describes the benefits and limitations inherent in an issue such as sustainable development. The chapter discusses a typology of sustainable development in the form of a sustainability continuum, which has been divided into five nodes. The issue of sustainability within the corporate environment is then introduced, followed by a brief comparison between a three-pillared and four-pillared approach to sustainability.

### 3.2 Sustainability and Sustainable Development: A Brief Evolutionary Synopsis of its development as a concept

By the middle of the twentieth century, people were starting to question the capability of the earth to sustain the affluent lifestyle of the developed world. Writers such as Leopold (1949), Vogt (1949), Osborn (1953) and Carson (1962) advocated a way of life that showed more consideration for the environment and which sought to reduce the environmental impacts caused by material and energy intensive activities. Rachel Carson's book (1962), entitled *Silent Spring* is thought of by many to be the launch pad to modern environmentalism. The United Nations Conference on the Human Environment, held in Stockholm in 1972 could be viewed as the conference where global environmentalism became operational. It marked the coming of age of the environmental movement and legitimised the importance of environmental issues in international relations (Thomas, 1992). In his book, *Small is Beautiful*, Schumacher (1973) highlights the nature of human activities and associated environmental and social costs associated with many development activities. He proposed that these could only be addressed by providing direction for society "towards a permanent and sustainable equilibrium" with nature and each other (Schumacher, 1973: p. 248). Solow (1974) and Daly (1997)

simultaneously advocated their concern over the nature of economic growth and development and its impact on the earth's limited resource base.

Concern about the impact of human activity on nature and the global ecosystem has grown steadily through the 1970's. It is generally accepted that the contemporary idea of sustainability hails from the United Nations Stockholm Conference on the Environment in 1972 and subsequent debates in the 1970s over "limits to growth" (Redclift, 1987). The United Nations Environment Programme (UNEP) suggested that the practice of development should aim to harmonise social and economic aspirations with environmental goals and objectives, leading to *sustained development* (UNEP, 1980: p. vi). One of the key underlying principles to this is that of sustaining the natural resource base and ecological stability, which requires a "*transition from a consumer society preoccupied with resource exploitation to a conserver society*" (UNEP, 1980: p. 24).

The following quote succinctly summaries the initial approaches to the sustainable development movement:

*"Beginning in the 1960s, a set of beliefs, values and concepts have emerged that gave shape and form to a philosophy of human conduct that argues for a development ethic that is environment-friendly, equity orientated, and future directed. The concept that is taking shape is called sustainable development or, more recently, sustainability."* (O'Riordan and Preston-Whyte, 1998 p.1).

The International Union for the Conservation of Nature and Natural Resources (IUCN), United Nations Environment Programme (UNEP) and the World Wildlife Fund (WWF) published the *World Conservation Strategy* in 1980 (Shippey, Unpublished Dissertation, 2001). This publication introduced the term sustainable development as being: *"...maintenance of essential ecological processes and life support systems, the preservation of genetic diversity, and the sustainable utilisation of species and ecosystems"*

One of the most influential definitions of the term sustainable development is that of the World Commission on Environment and Development (WCED, 1987). In its 1987 report, entitled *Our Common Future* (also known as the Brundtland Report), sustainable development was defined as: *"...development that meets the needs of the present*

*generation without compromising the ability of future generations to meet their own needs*" (WCED, 1987 p.8). The IUCN, UNEP and WWF published a follow up publication to the World Conservation Strategy called: *Caring for the Earth: A strategy for sustainable living*, which challenged the WCED definition by calling for "*Improving the quality of human life while living within the carrying capacity of supporting ecosystems*" (IUCN *et al.* 1991, p10). The International Council for Local Environmental Initiatives (ICLEI) emphasizes environmental, social and economic concerns as three distinct, but interrelated, components of sustainable development: "*Sustainable development is a programme to change the process of economic development so that it ensures a basic quality of life for all people, and protects the ecosystems and community systems that make life possible and worthwhile*" (Van der Merwe & Van der Merwe, 1999).

These macroeconomic definitions do not however provide much guidance on how this concept should be put into operation at micro-scales. They focus on the importance of long-term planning but are too vague as a policy tool and does not provide specifics about which needs and desires must be met and fulfilled and how (Nagpal, 1995). The concept of sustainable development thus arose through the joint reflections on development and the environment at an international level and can be described as an international cooperative negotiation process that has resulted in the creation of this new value (Lourdel, 2005).

The concept of sustainable development remains poorly defined, or perhaps over-defined, in that hundreds of different interpretations now compete for attention (Schmidheiny *et al.* 1997). Many business managers still question how to implement a strategy to encourage corporate sustainability when there are many competing organizational constraints and numerous barriers to implementation (Epstein and Roy, 2001). Although the term sustainable development remains vague and often thought of by critics as inherently self-contradictory, O'Riordan, a strong critic of the concept, conceded that "the term has stuck...Like it or not, sustainable development is with us for all time" (ORiordan, 1993, p37).

Various authors emphasise different priorities, ranging from those with ecocentric beliefs who argue that ecological concerns should underpin all decision-making to those with anthropocentric outlooks who emphasise the importance of human economic and social

needs (Baker *et al.* 1997). Differing perspectives of sustainable development have been grasped by ecocentrists and technocentrists and it has been said that this could lead to a cautioning against the rhetoric of sustainable development (Caldwell, 1992). Caldwell challenges the focus of sustainable development while arguing that the focus should rather be on finding out what kind of environment is good for human life (Caldwell, 1992). Another approach could be to caution against the potential rhetoric of sustainable development while continuing to seek better solutions and refine our understanding of sustainable development in different contexts.

The next section outlines the notion of a sustainability continuum and the rationale between competing sustainable development viewpoints before focusing further on sustainability within a corporate context and the concept of corporate sustainability.

### 3.3 The Sustainability Continuum

The conception of Sustainable Development can be seen as a continuum of possible meanings going from the 'weak' position to the 'strong' position (Moneva *et al.* 2006). The weak sustainability position does not question the present mode of economic development and views sustainable development as being compatible with some modified version of 'business as usual' (Beddington, 2001). Wilson *et al.* (2006) views this weak sustainability position as one that is contingent upon economic growth, in its current neo-classical form. Strong sustainability on the other hand questions the current economic approach to growth and champions the need to modify and redirect growth without exceeding ecological thresholds. In strong sustainability it is argued that continuous growth is impossible and may need to be abandoned as a dominant economic goal (Laine, 2005). Economic growth is considered to be a major cause of the social and environmental problems and pursuing it will severely hinder society's chances of achieving sustainable development.

It could therefore be suggested that the conflicting views of sustainability have developed through the need to find a simple definition to a difficult concept. This duality between strong sustainability and weak sustainability is only part of the conflicting sustainable development approaches. The operationalisation of the concept of sustainability is therefore both difficult and contentious and different approaches and

methodologies will lead to different 'levels' of sustainability. The next section introduces a broad outline to the different views along the sustainability continuum.

### **3.3.1 The Five Nodes of Sustainability**

The philosophical views and principles underlying differing approaches to sustainable development will invariably lead to different sustainability outputs. The following five nodes within the sustainability continuum have been used to outline the differing levels and approaches to sustainable development. They have been adapted from Baker *et al.*, 1997.

- Ideal sustainability - The most biocentric approach to sustainable development, which is based on the premise of a radical shift in the structure of our societal, political and economic systems.
- Strong sustainability - Based on an understanding that "environmental protection is a precondition of economic development" and that policies and economic development must be built upon the maintenance of the productive capacity of environmental systems.
- Moderate sustainability - There are initial moves to incorporate and implement some of the facets of strong or ideal sustainable development into plans and policies.
- Weak sustainability- Economic development is the primary objective and environmental costs are accounted for in conventional (neoclassical) accounting.
- Treadmill sustainability - Sustainable development is acceptable simply as the expansion of Western Capitalism into areas that "have not felt the benefits of development in material terms".

Undoubtedly, the publication of *Our Common Future* in 1987 and the subsequent United Nations Conference on Environment and Development (UNCED) held in Rio in 1992 and the World Summit on Sustainable Development (WSSD) held in Johannesburg in 2002, have helped to bring about the development of a shared consciousness about the need

to reflect deeply on the ways society can contribute to social welfare without threatening survival of the earth (Moneva *et al.* 2006). Yet there seems to be no clear consensus of what constitutes sustainable development and, at present, the only major point of consensus from these efforts is that sustainable development means different things to different people (Wilson *et al.* 2006). It has been said that part of the problem and, part of the attraction for policy-makers and lobbying groups, is that sustainability can be made to mean what one would like it to mean (Moneva *et al.* 2006). For example, business interest groups have actively sought to tame the concept of sustainable development to mean no more than a level of social and environmental engagement that corporations can easily accommodate (Laine, 2005).

The business interpretation of sustainability predominantly falls within the ambit of weak sustainability. Weak and strong sustainability viewpoints differ greatly with regard to the extent of belief in the capability of current financial institutions to learn and to achieve sustainable development. Thus, it is not only about sustainable development, but also about the kind of sustainable development approach is taken (Laine, 2005).

### 3.4 Sustainability in the South African context

It would be inappropriate to assume that sustainable development can be achieved in South Africa by fully adopting the paradigm of a developed country. South Africa has placed a high priority of fast economic growth and inevitably this will bear a number of social and environmental costs. Similarly, given South Africa's history, it would be inappropriate to implement an approach that in any way reinforces injustices of the past (Brown *et al.* 2005). This does not mean that sustainable development initiatives are unlikely to succeed but it does mean that if practical and meaningful solutions are to be found, they should be adapted to the local context if long-term sustainable solutions are to be realised. One needs to take into account that the last ten years in South Africa has been an era in which there was unprecedented policy development, stimulated by the need to address the historical legacy of unequal social development (Rossouw and Wiseman, 2004).

The next section introduces the adoption of the sustainable development concept by corporate institutions.

### 3.5 Sustainable Development in the Corporate Context

Sustainable Development has become increasingly relevant in the agendas of corporate executives after the Brundtland Report was launched in 1987 (Moneva *et al.* 2006). Worldwide, a more sustainable development path has become increasingly accepted by corporate organizations as important to their continued existence and development as well as for the good of both the natural and social environments.

Morhardt (2002) gives the following principal reasons for the corporate shift to sustainability reporting:

- The attempt to meet regulatory requirements and reduce the potential cost of future regulations by adopting a pro-active approach.
- The effort to bring operations into line with environmental codes, especially when under the threat of sanction for non-fulfilment.
- An effort to reduce operating costs.
- An attempt to improve stakeholder relations.
- An attempt to improve the public perception of the company's environmental activities and thus maintain and enhance its competitive position.
- The recognition that the adoption of an active environment management approach will serve to reinforce a company's social legitimacy.

The Global Reporting Initiative (GRI) sustainability reporting guidelines were developed as a way of helping organizations to report on their environmental, social and economic performance and to increase their accountability. Under this approach, known as Triple Bottom Line Reporting, the Global Reporting Initiative (GRI) sustainability reporting guidelines were developed with the aim of assisting "reporting organisations and their stakeholders in articulating and understanding contributions of the organisation to sustainable development" (GRI, 2002). The "triple bottom line" approach addresses the

environmental performance, economic performance and societal performance of the company. Nowadays, many companies recognize and monitor these three aspects using sustainability indicators, which provide information on how the company contributes to sustainable development (Azapagic and Perdan, 2000).

The concept of Sustainable Development that underlies the GRI guidelines however does present some shortfalls and weaknesses that contribute to the perception that Sustainable Development is a simple procedure that is limited to a disclosure of sustainability information corresponding to the current year rather than the long-term integrated business view of sustainability (Moneva *et al.* 2006). Nevertheless, the GRI guidelines marked an important step in operationalising sustainable development in the corporate environment.

In Gray, Beddington and Walter's 1993 book, entitled "Accounting for the Environment", a simple yet effective suite of questions is posed to help clarify the attitude and objectives of what "path" of sustainability is intended. A clear understanding of the position adopted with respect to sustainability can be ascertained by answering the following question:

- Sustainability of what?
- Sustainability for whom?
- Sustainability in what way?
- Sustainability for how long?
- Sustainability at what level of resolution?

Objective answers to these questions allows an organization to decipher what their motivations are for moving along a more sustainable path, what they intend to achieve and how detailed they plan to be when approaching sustainability issues.

### 3.6 The Three-Pillar vs. Four Pillared Approach to Sustainability

The “three-pillars approach” views Sustainable Development as referring simultaneously to economic, social and environmental systems, all of which must be simultaneously sustainable. This sustainability approach is a process by which companies integrate their economic, social and environmental objectives into their business strategies and optimize the balance among all three (Szekely and Knirsch, 2005). Conceptually, the three-pillar approach to sustainable development is one of the more challenging approaches as it includes the aspiration of managing each pillar as well as the relations among the pillars. Some frameworks also include a fourth dimension, namely “institutional”, as introduced by the United Nations approach (Labuschagne et al. 2005). If sustainability is to be taken seriously by businesses, there needs to be a clear process that makes explicit the costs and benefits to the social, economic, environmental, and institutional, the four pillars of sustainable development, while remaining practical and informing and improving decision-making. The institutional pillar is considered a crucial addition to the traditional three-pillar approach to sustainability. The institutional pillar consists of a range of policies and practices that help to define and delimit manager’s roles, responsibilities, actions and privileges. Therefore the institutional pillar acts as the essential ‘adhesive’ between the environmental, social and economic pillars, merging them together and ensuring that all three are given equivalent priority in the drive towards, what is referred to from now onwards as ‘corporate sustainability’.

Corporate Sustainability involves sustaining and expanding economic growth, shareholder value, prestige, corporate reputation, customer relationships, and the quality of products and services. It also means adopting and pursuing ethical business practices, creating sustainable jobs, building value for all the company's stakeholders and attending to the needs of the underserved (Szekely and Knirsch, 2005). Andrew Stark (1993) challenges the current corporate approaches to sustainability by stating that “*to be ethical as a business because it may increase your profits is to do so for entirely the wrong reason. The ethical business must be ethical because it wants to be ethical*” (Stark, 1993).

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Confusion exists regarding the difference between Corporate Social Responsibility and related terminology such as corporate social investment. The

terms however refer to very different concepts therefore it is important to describe these differences and highlight any causal relationships.

The next chapter explains these different approaches to operationalising sustainable development and explores the concept of Corporate Sustainability.

# Chapter 4

## 4. Corporate Sustainability

### 4.1 Introduction

The following chapter will underline the theoretical foundation of Corporate Sustainability in the context of sustainable development and related terminologies. The chapter will move on to describe the rise of Corporate Sustainability in contemporary business practice as well as highlight the perceived business benefits and challenges faced by companies who choose to position sustainability high up on the company agenda. From this point onwards, the focus of the dissertation will shift from describing Corporate Sustainability in a broad theoretical sense, to focusing more on the practical issues surrounding the implementation of Corporate Sustainability, specific to a retail situation.

The retail industry is recognized as an important go-between linking producers with consumers and therefore playing a critical role in shaping sustainable production and consumption patterns. Many retailers have recognized their important role in achieving sustainable consumption and have begun reporting the sustainable performance of their company alongside traditional financial outcomes. Furthermore, retailers recognize sustainability as a niche market that provides competitive advantage. For this reason sustainability concerns are becoming incorporated into the strategic level decision-making. An opportunity exists to develop a management system that will measure and monitor company level sustainability performance on an ongoing basis. A number of management systems have subsequently been developed, such as the generic 'firm level' ISO 14001 Environmental Management System, however there is currently no recognized tool that can assemble company wide sustainability information and represent it in a well summarized and accurate composite format. In closing this chapter introduces the need to develop a retail composite sustainability index.

### 4.2 What is Corporate Sustainability?

Corporate Sustainability can be viewed as a new and evolving corporate management paradigm. The term paradigm is used intentionally, in that Corporate Sustainability is an

alternative to the traditional growth and profit maximisation model (Wilson, 2003). While Corporate Sustainability recognises that corporate growth and profitability are important, it also recognises how the dominance of the market economy over the last 50 years has created a corresponding need for self actualization and mobilization on the part of the business community, in the interest of social stability and the goals of sustainable development.

A review of literature suggests that the concept of Corporate Sustainability borrows elements from four established concepts: 1) Sustainable Development, 2) Corporate Social Responsibility, 3) Stakeholder Theory, and 4) Corporate Accountability Theory (Wilson, 2003).

#### **4.2.1 Sustainable Development**

According to Wilson (2003), sustainable development contributes to Corporate Sustainability in two ways. Firstly it helps set out the areas that companies should focus on: environmental, social, and economic performance. Secondly it provides a common societal goal for corporations, governments and civil society to work toward: ecological, social and economic sustainability. However, in a corporate sense, sustainable development does not provide enough justification as to why companies should adjust existing and successful profit orientated strategies to accommodate these issues (Primeaux, 1997). According to Wilson (2003) these arguments come from Corporate Social Responsibility and Stakeholder Theory.

#### **4.2.2 Corporate Social Responsibility**

Much like sustainable development, Corporate Social Responsibility (CSR) is a broad, dialectical concept. CSR contributes to corporate sustainability by providing ethical arguments as to why corporate managers should work toward sustainable development: society in general believes that sustainable development is a worldwide goal; corporations have an ethical obligation to help society to move in that direction (Wilson 2003).

### **4.2.3 Stakeholder Theory**

The basic premise of stakeholder theory is that by having strong trustworthy working relationships with all your stakeholders, a company is able to meet its strategic objectives with greater proficiency (Freeman, 1984). According to Wilson (2003), stakeholder theory suggests that it is in the company's best interest to work in this direction because doing so will strengthen its relationship with stakeholders, which in turn will help the company meet its business objectives.

### **4.2.4 Corporate Accountability**

Accountability refers to a company's ethical and legal duty to disclose and report on actions for which the company is held responsible. Wilson (2003) describes the underpinnings of Corporate Accountability in Corporate Sustainability in that it helps to define the nature of the relationship between corporate managers and the rest of society.

Corporate Sustainability therefore borrows elements of all four of the above concepts and merges them into a completely new paradigm. Sustainable development provides the foundation for the subject matter and helps to identify the overarching societal goal, Corporate Social Responsibility provides the ethical arguments as to why corporations should work towards sustainability goals, Stakeholder Theory provides business arguments as to why corporations should work towards sustainability goals, and Corporate Accountability Theory provides ethical arguments as to why a company should report on sustainability performance. The result is a completely new sustainability paradigm that attempts to justify sustainable development with the use of ethical and business related arguments (Wilson, 2003).

## **4.3 Reasons for Adopting Corporate Sustainability**

*"It does not really matter why companies implement sustainability principles in a corporate environment: what is important is that they do"* (Hawkins, 2006)

The above statement was made in response to the general understanding that most companies incorporate the principles of sustainability in an effort to satisfy selfish

objectives. This however comes as no surprise if one considers the competitive and prudent nature of profit driven business. Therefore it is commonly accepted that Corporate Sustainability will not succeed if it is based purely on principles of altruism. If Corporate Sustainability is to achieve widespread success, it needs to make good business sense (Shinn, 2005).

There are varying levels of commitment that a company can show when adopting a sustainability approach to managing a business. Much like sustainable development, there are strong vs. weak approaches to Corporate Sustainability (Atkinson, 2000). Weak Corporate Sustainability refers to corporations who adopt sustainability principles in response to external stimuli such as government or policy making, according to compliance and regulatory-based standards (Benn and Dunphy, 2003). Strong Corporate Sustainability reflects a more proactive approach that goes beyond compliance standards and recognizes the need of forward planning for sustainability (Benn and Dunphy, 2003).

A plethora of literature describes the business advantages of incorporating a sustainability approach to corporate strategy (Porter, 1990; Ulhoi, 1994; Waddock and Graves, 1997; Willard, 2002; Schaltegger and Wagner, 2006). Neslon (2002) summarizes them as follows:

- Managing risk
- Protecting and enhancing reputation and brand equity
- Building trust and gaining a 'license to operate'
- Improving resource efficiency and access to capital
- Responding to or pre-empting regulations
- Establishing good stakeholder relationships with current and future employees, customers, business partners, socially responsible investors, regulators and host communities
- Encouraging innovation
- Building future market opportunities
- Investing in more stable and prosperous societies

Accumulatively, the aforementioned rationales advocate a strong business argument for Corporate Sustainability; however in reality it is not as clear-cut. Considering that the

primary objective of any business is to operate at suitable levels of profitability and to satisfy stakeholders (Primeaux, 1997), it is important to understand what impact sustainability will have on the financial outcomes of an organization.

#### **4.3.1 Impact on Profitability**

According to Szekely and Knirsch (2005), the accumulative outcome of all the benefits of corporate sustainability together, is a business that achieves high levels of profitability and a business that sustains activities over the long term. Many other theorists share a similar view however the correlation is more tenuous. In fact there is much controversy as to whether corporate sustainability generates profit. Results from earlier empirical work indicate an ambiguous relationship (Alexander and Buchholz, (1982); Ullman, (1985); Shane and Spicer, (1983). It is only over the last 15 years through widespread analysis and with the use of a greatly improved data; that research has begun to show a consistently positive relationship between profit and sustainability (Baron (2000); Dowell *et al.* (2000); Hart and Ahuja (2001); Orlitzsky *et al.* (2003). Furthermore, even when a positive relationship is established, it is still unclear whether financially successful companies simply have more resources to spend on implementing sustainability, and therefore attain a higher standard or whether better performance along various dimensions of sustainability itself, results in better financial outcomes (Waddock and Graves, 1997).

Whatever the relationship, common sense suggests that if Corporate Sustainability is overstated in a business context it will be doing so at the expense of the company's key focus, which will have negative profit making implications (COM, 2006). Ulhoi (1994) shares a similar view and believes that a Corporate Sustainability can only be a successful business strategy if it remains business driven.

There is obviously a fine line between the extent of a company's commitment to sustainability and level of profitability. Nelson (2002) concurs and believes that there is not always a 'win-win' business case for being a responsible company. There are situations where business leaders must chose to incur additional costs with no immediate pay-back or to forgo opportunities, because it is the right thing to do based on their companies values, principles or policies. Therefore the challenge for a truly sustainable company is to openly decide and determine the specific values of a

company. This set of values can be inscribed into company policy and subsequently used as a guide for strategic decision-making purposes. This way sustainability issues can be incorporated into the companies traditional profit driven 'decision making matrix'.

#### 4.4 Further Barriers and Challenges

Maintaining suitable levels of profitability is just one of the many challenges facing managers and policy makers when attempting to mainstream sustainability into company practice. (Szekely and Knirsch, 2005) believe that one of the most important barriers to adopting a business case for sustainability is how to plan for their short and long term future of a sustainability strategy. Most companies use a short to medium term planning horizon when developing business strategies. Similarly, businesses are quick to evaluate and determine the relative success of these initiatives. The fickle nature of consumer markets means that, failure to achieve immediate results often results in a change of strategy. Sustainability strategies however require risk management and long term scenario planning before financial results are observed (Szekely and Knirsch, 2005). Managers are therefore required to go against standard practice and show greater determination and persistence when managing sustainability issues.

The consumer markets response to a company's sustainability approach is of further concern to managers (Szekely and Knirsch, 2005). Customers are showing growing interest in a company's commitment to sustainability. This interest is often reflected in customers purchasing behavior, which is influenced by issues such as product quality, product ingredients or health and safety (Szekely and Knirsch, 2005). Companies incur additional costs in an effort to meet these sustainability standards; however this investment is not always rewarded with the customer's willingness to pay a premium price. Company's therefore find themselves in a catch 22 scenario; implement a sustainability strategy that may not receive positive customer response or ignore the need for incorporating sustainability issues into company strategy and run the risk of tarnishing the company's reputation.

Despite the myriad of challenges Corporate Sustainability, managers are increasingly asking how companies can improve sustainability performance and what needs be done to ensure long-term success? (Epstein and Roy, 2001) A number of factors have emerged as being essential for successful Corporate Sustainability.

## 4.5 Critical Success Factors to Corporate Sustainability

The success of a corporate sustainability initiative is relative to the sustainability targets and objectives of that particular organization (Deloitte, 2006), however there are a number of recognized success factors that a company needs to fulfil to achieve sustainability performance. Szekely and Knirsch (2005) identify leadership, flexibility and stakeholder engagement as being prerequisites.

### *Leadership*

A recurring theme throughout the literature suggests that before sustainability practice can take root in an organization, it is critical that the issues are understood and appreciated at board and executive level (Triandis, 2005). In so doing, top-level management has the responsibility of leading the sustainability agenda and devolving necessary responsibilities executive and management level personnel. These individuals are then responsible for not only ensuring that the message is integrated into business strategy and culture, but also communicated to all levels of company employees.

### *Flexibility to Change*

Much like the ISO 14001 Environmental Management System relies on the guiding principles of 'continuous improvement'; a Corporate Sustainability approach involves continuous effort, investment and adaptation (MacDonald, 2005). The main difference between the two systems is that ISO1001 does not address strategic planning for sustainability, whereas Corporate Sustainability places sustainability within the company's strategic decision-making matrix (McDonald, 2005). Company strategy is traditionally managed under principles of adaptive management whereby emphasis is placed on the "systematic acquisition and application of reliable information to improve management over time" (Lee 1999). Reliable information is attained through a sophisticated measurement system that monitors progress and provides feedback to decision makers so that adjustments can be made to a particular strategy if necessary (Holling 1978). In essence strategic planning is a flexible system that monitors performance and allows for change. Therefore if sustainability issues are to be included at a strategic level, sustainability strategies need to be monitored and evaluated by a

system that provides feedback to facilitate necessary change and improvement (Epstein and Roy 2001).

#### *Stakeholder engagement*

As described earlier, Freeman's stakeholder theory explains how by developing stronger relationships with ones stakeholders, a company is making positive steps towards achieving its business objectives. There are many explanations for this. Argawal (2001) argues that multiple stakeholder engagement provides multiple perspectives helping develop a comprehensive and representative understanding of a particular problem. Schindler and Cheek (1999) believe that greater stakeholder engagement at the forefront of management decision making helps to reveal issues of concern, provides an early warning system, diversifies the range of alternative management strategies and explores the consequences of these choices. The most important benefit to be gained through stakeholder engagement is its ability to build trust with employees, customers, suppliers, and shareholders by demonstrating the company's openness and willingness to be accountable for its actions and impact on society (Szekely and Knirsch, 2005)

Accumulatively these factors help to create a constructive business environment that is characterized by credibility, transparency and strong investor confidence.

Having introduced the concept of Corporate Sustainability and its relationship with sustainable development, the following section of the paper introduces the application of corporate sustainability from a retailing perspective.

### 4.6 Corporate Sustainability in the Retail Context

The retail trade is defined as the selling of individual units or small lots directly to multiple consumers (usually the ultimate consumers of the goods) by business established for that purpose (UNEP, 2003). The industry has grown from humble beginnings, with the world's first peddlers and marketplaces, to a mega industry that accounts for 23% of the worlds GDP, accounts for 35% of consumer expenditure, and constitutes the second largest employer in developed countries (Cox and Brittain, 2004).

Much of this growth occurred between the period of 1980 and 1998 and was attributed to the customer's ability to pay (disposable income) as well as their willingness to buy

(consumer confidence) (UNEP, 2003). This period is commonly referred to as the 'rise of consumerism' and is characterized by a 68% increase in household consumption (UNEP, 2003). Retail contributed to this rise in consumption through the introduction of the department store; implementation of aggressive advertising techniques as well as improving customer service (Robins, 1999).

The emergence of consumerism has been successful at meeting the profit driven objectives of retailers as well as the market objectives of the capitalist economy, however juxtapose to this tremendous growth, consumption patterns are having an equal and opposite impact on the environment.

Modern day consumption patterns are putting severe stress on the limited available resource base and is resulting in mounting waste and discharges to the environment (UNEP, 2006)

This understanding has emerged as a focus of many recent international conventions and forums. At the World Summit on Sustainable Development in 2002, governments urged active work to speed the shift to sustainable production and consumption (UNEP, 2006). In February 2003, at the United Nations Environmental Programme's Governing Council (UNEPGC) meeting, ministers voted to strengthen work on sustainable consumption, promote design of sustainable products and services, reinforce voluntary work with business sectors, and increase support for awareness raising campaigns (UNEP, 2003).

It is well recognized that governments and international bodies can develop strategies for sustainable development, establish frameworks for sustainable consumption and production and facilitate movement towards such goals, but ultimately it is the producers and consumers that will largely determine the extent to which such goals are achieved (Jones *et al.* 2005)

Retailers have a pivotal role to play here because they act as a crucial link between suppliers and consumers – in effecting this global shift (COM, 2006). This link allows retailers to communicate the demands of customers upstream to their suppliers as well as deliver new products and services downstream to their customers (Durieu, 2003). They are well positioned to exert pressure on producers in favour of more sustainable

consumer choices. Similarly they are in an authoritative position as they are able to use their buying power to control the actions and attitude of their supply chain (Dialogue, 2005).

The retail industry is therefore in a strong position to encourage sustainable consumption. The United Nations Development Program identified three main areas in which retail can contribute to sustainable consumption activities. Cleaner production and environmental management systems; supply chain management; and education and information for customers.

### **1. Cleaner Production and Environmental Management Systems**

The retail sector can first control and manage its own environmental and social impacts through implementing environmental management systems for energy/water conservation, waste management, logistics, recycling programs, etc.

### **2. Supply Chain Management**

As retailing becomes increasingly consolidated and increasingly global — sourcing products from all over the world — there is a growing feeling of exposure in the supply chain, especially given the growth of retailer private brands. In addition to monitoring product safety, quality, cost and speed, retailers must make certain that the products they sell are being produced by companies that adhere to basic human rights principles and provide a reasonable standard of living to their employees. Retailers often set supplier codes of conduct that stipulates their sustainability terms and encourages suppliers to comply with these standards.

### **3. Education and Information to Customers**

For sustainability to be a priority to the retailer, it needs to be a priority for the customer. The only way this can be achieved is by educating customers about the initiative and giving them enough information, choice and advice on sustainable products and services.

#### **4.6.1 Retailers Response**

Overall, retailers have understood the importance of engaging in sustainable strategies- not only as a forced response but, but also as a voluntary step (Durieu, 2003). Growing customer awareness on sustainability has accelerated the rate at which retail companies addressed these issues. Customer awareness coupled with growing shareholder expectations has catapulted sustainability into many retail organizations risk management strategy alongside the traditional issues of financial compliance (Deloitte, 2006).

Awareness of the non-financial risks confronting companies is growing and it is transforming corporate reporting practices. A review of the annual reports of major retailers finds a significant improvement in corporate efforts to build trust with shareholders, customers and employees to through the disclosure of non-financial reporting (Deloitte, 2006). This reporting practice is commonly known as triple bottom line reporting, the goal of which is to highlight the efforts that the company is making to improve the overall sustainability performance of the organisation (Trialogue, 2005).

The types of sustainability initiatives that retailers are reporting on include, improving waste management in operations and across supply chain, encouraging local procurement, reducing stores energy consumption, improving the environmental efficiency of the logistics fleet, improving employee well being, health and safety, and sustainability product innovation, etc.

Although this trend is encouraging, and while the implementation of Sustainability Reporting is a good start, too often it is a public relations exercise that serves to show a company in good light- rather than mechanism for identifying areas of weakness and facilitating continuous sustainability improvement (Daub, 2005). For this reason it is difficult to encourage sustainability commitment across a retail organisation (Trialogue, 2005).

If sustainability is going to receive thorough commitment throughout the organisation and become part of its every day activities, it needs to be elevated high up on the company agenda (Salzmann *et al.* 2005). The only way that can be achieved is by developing a comprehensive sustainability strategy that defines the companies desired level of

commitment and sets direction for the actions to be undertaken and identifies their impact on corporate social, environmental, economic and institutional performance (Epstein and Roy, 2001). The hopeful outcome of a successful sustainability strategy should be a system that carefully identifies and articulates the main issues driving Corporate Sustainability, and has mechanisms in place that measure the performance of these issues over time. These measurements assist in the ongoing management and continuous improvement of sustainability performance over time.

A typical retail company consists of a number of separate departments or 'business units' each of which serves a particular role in the overall functioning of the organisation (See Figure 2). Each of these units has unique sustainability concerns as well. For example the primary sustainability concern for the logistics division would relate to 'energy conservation' or 'employee well-being', whereas the finance division would be more focussed on issues regarding 'legal compliance' or 'level of disclosure' of financial information.

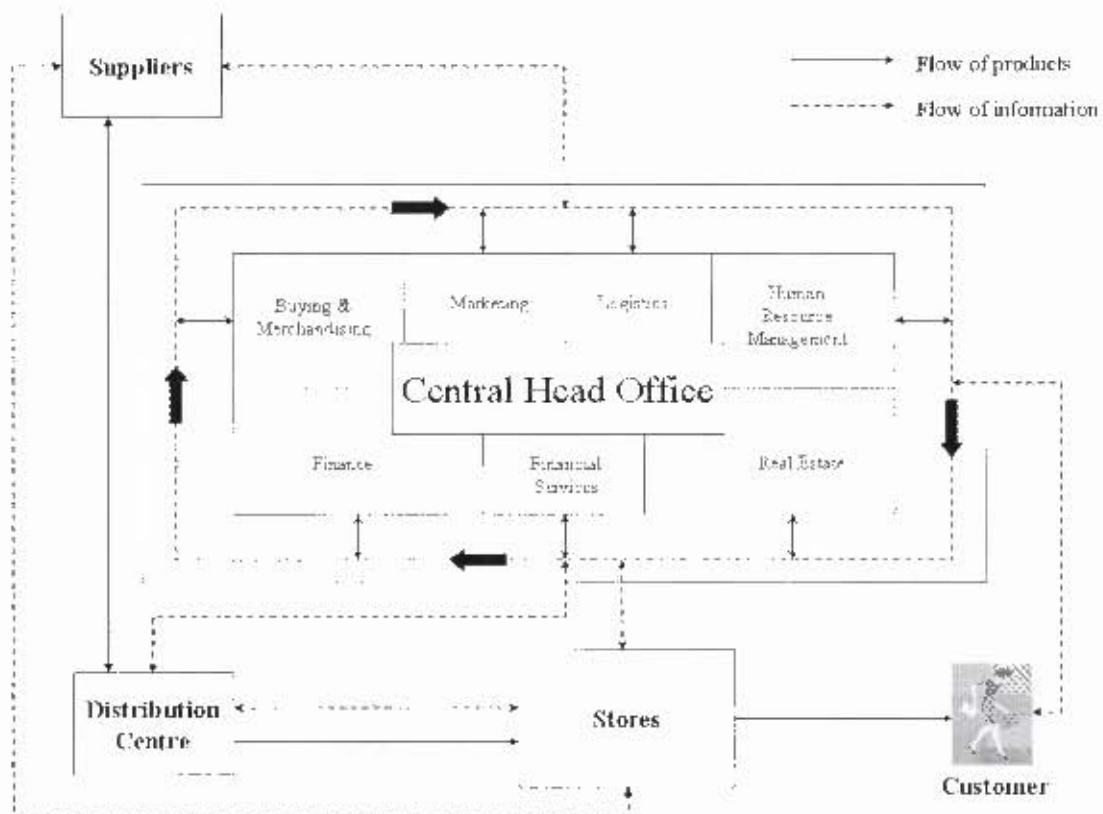


Fig. 2. Structure of typical retail organisation (\*Adapted from Rafiq and Varley, 2003)

The diverse nature of sustainability issues across the different business units could provide some strategy implementation difficulties, however experience has shown that this can be overcome by either, giving the individual business units autonomous control over management of their local sustainability issues or through centralised control whereby central head office has independent ruling thereof (Epstein and Roy, 2001). These decisions should be appropriately aligned with corporate culture (Epstein and Roy, 2001).

Whatever management structure is used, the sustainability strategy must be representative of sustainability issues across all areas of the business. Obviously, companies in different industries and different countries are exposed to widely different pressures from different political institutions, customer and community activists. Similarly the choice of which sustainability issues an organisation should incorporate and the extent to which it should be applied, reflect value judgements and as well as the companies level commitment, i.e. whether to apply weak, strong, or very strong sustainability (Hill and Bowen, 1997). These pressures will have strong influences over what sustainability issues to prioritise, however it must be remembered that for a company to be truly sustainable, it needs to incorporate all aspects of the sustainability paradigm, namely the economic, social, environmental and institutional pillars. The sustainability issues for Corporate Sustainability across the four pillars are summarised in Figure 3. These issues can be used as a checklist for managers to make the important decision on which issues should or should not be applied and which compliment their company's level of sustainability commitment.

## Overarching Critical Success Factors

- Executive Level Commitment and Leadership
- Flexibility to Change
- Stakeholder Engagement

<p style="text-align: center;"><b>Pillar 1: Social Sustainability</b></p> <ul style="list-style-type: none"> <li>• Seek employment equity and diversity by correcting any racial or gender imbalances across all areas of operation.</li> <li>• Encourage skills development and training in the workplace.</li> <li>• Consumer education initiatives with the objective of informing consumers about the benefits of sustainable product alternatives.</li> <li>• Corporate Social Investment or voluntary corporate philanthropy is a way for companies to contribute to society and community.</li> <li>• Develop structure to manage employee relations i.e. workplace forums</li> <li>• Show dedication to health and safety issues such as employee well being and chronic diseases such as HIV/Aids</li> <li>• Enforce upstream citizenship and sustainability focus throughout the company supply chain.</li> <li>• Increase the net positive impact of products and services on society by improving their environmental and social performance.</li> <li>• Advocate transparent and ethically sound customer communication and advertising techniques.</li> </ul>	<p style="text-align: center;"><b>Pillar 2: Economic Sustainability</b></p> <ul style="list-style-type: none"> <li>• Enhance competitiveness in the market place by adopting policies and practices that advance sustainability.</li> <li>• It is important that the company shares responsible and ethical relationships with their suppliers. This can be created by developing a formal policy that states the rules of engagement and reflects the responsibilities of both parties.</li> <li>• Monetary values should be apportioned to areas of indirect benefit such as local economic development, community development and empowerment initiatives and included in financial reporting.</li> <li>• Companies should measure the flow of money between the company and its stakeholders, and show how the organization affects the economic circumstances of those stakeholders.</li> <li>• Use full cost accounting and real-cost pricing to set prices and tariffs.</li> <li>• Must have a strategy allowing for the disclosure of information relating to direct economic impact.</li> <li>• Encourage maximum transparency and disclosure of both financial and non financial information.</li> <li>• Show preferential procurement to local suppliers.</li> </ul>
<p style="text-align: center;"><b>Pillar 3: Environmental Sustainability</b></p> <ul style="list-style-type: none"> <li>• Energy usage across all the different units of an organization should be reduced and controlled through monitoring and evaluation.</li> <li>• Reduce reuse and recycle waste as much as possible throughout all levels of operation during all stages of the products lifecycle.</li> <li>• Strong efforts should be made to reduce fuel consumption as well as increasing the overall environmental efficiency of the distribution fleet.</li> <li>• Reduce the consumption of water across all business units and activities of the organization.</li> <li>• Strong effort should be made to reduce the impact of both the suppliers (e.g. framers, fisherman) and operations (e.g. real estate development) on biodiversity.</li> <li>• Promote and market products that respect animal welfare and do not engender animal testing or abuse.</li> <li>• Ensure that noise management practices are in place so as to reduce noise levels throughout operations.</li> <li>• Advocate technology (e.g. refrigeration, vehicles) that provides the healthiest and most non toxic alternative.</li> <li>• Construct durable, reliable, and functional structures that use renewable resources over non renewable, and minimize damage to scenic, cultural, historical and architectural landscapes</li> </ul>	<p style="text-align: center;"><b>Pillar 4: Institutional Sustainability</b></p> <ul style="list-style-type: none"> <li>• Comply with relevant legislation and regulations</li> <li>• Establish company level sustainability policy which serves as an institutional framework for sustainability implementation.</li> <li>• Extend sustainability commitment over and above legal and regulatory framework by meeting or exceeding voluntary corporate governance recommendations.</li> <li>• Company-wide mechanisms and remedies to ensure compliance with company governance policies.</li> <li>• Create a risk management strategy which covers all aspects of sustainability and effectively identifies non financial risks.</li> <li>• Develop board level structures and processes for overseeing the management of sustainability risks</li> <li>• Develop structures and nominate individuals responsible for implementing and auditing sustainability performance.</li> </ul>

**Fig. 3. Corporate Sustainability Issues**

According to McDonald (2005) while identifying key sustainability issues is a first step conceptually, a set of issues does not necessarily help managers take more concrete steps from a strategic planning perspective. Bridging the gap between guiding issues and action is required McDonald (2005).

This is achieved by developing a proper management framework or tool to help guide and monitor the implementation process. The most popular tool at a general firm level has been ISO 14001 Environmental Management System. This system has perceived weaknesses in terms of its ability to strategically identify ultimate objectives that comply with the basic principles of sustainability (McDonald, 2005). ISO 14001 is also traditionally applied focussing solely on relative improvements in performance without an ultimate sustainability target.

#### **4.6.2 Developing an Appropriate Sustainability Management System**

For sustainability to form part of a retail organisations business strategy, the process needs to be driven by a set of objectives and desired level of performance (Epstein and Roy, 2001). In addition, the SMS must allow for periodic evaluation to determine the relative performance of sustainability outcomes. This evaluation provides an important feedback loop to management who can then take corrective action.

There is a growing amount of research on the development of a management system, tool or methodology that serves to measure the progress that companies are making toward sustainability in both a composite and qualitative fashion (Kranjnc and Glavic, 2005; Atkinssen and Hatcher, 2001). Despite the indices that have been developed, there is still no useful method for a company led integrated sustainability assessment (Szekely and Knirsch, 2005). The most glaring omission in sustainability methodologies to date has been their inability to assemble disparate sustainability information into a composite format, to represent the overall sustainability status of a retail company and inform strategic decision-making (Kranjnc and Glavic, 2005). For a strategically motivated sustainability initiative to work, the evaluation stage of a sustainability management system requires a tool that will represent extensive sustainability performance in a condensed well-summarised layout that can be used to present findings to managers and shareholders, to inform decision-making (Ko, 2005).

This has provided an opportunity to investigate existing sustainability assessment frameworks, identify various strengths and weaknesses, and ultimately develop a model with necessary evaluative capacity required to inform strategic level sustainability management.

The next chapter will introduce existing composite methodologies and evaluate their relative effectiveness at satisfying the strategic level sustainability objectives of a retail organization.

# Chapter 5

## **5. Theory and Review: A Review of Sustainability Assessment Frameworks and Composite Sustainability Assessment Indicators**

### 5.1 Introduction

This chapter begins by juxtaposing the concepts of sustainability reporting with the concept of sustainability assessment. A list of General Principles and Criteria for the design of a sustainability assessment framework and the construction of a CSDI are then introduced. This is followed by a brief evaluation of existing sustainability assessment frameworks. Two selected frameworks are each discussed with reference to how they may accommodate the stated principles and criteria.

The stated Principles and criteria are applied in a brief comparative analysis of the salient features of some selected existing CSDI models. From that analysis a CSDI model is selected that is most appropriately suited for adaptation to sustainability in the corporate retail context.

### 5.2 Sustainability Reporting and Sustainability Assessment Appraisal

Measuring performance is, of course, nothing new in the business world. Companies have long had elaborate accounting procedures, which permit the tracking of results across a range of issues. The data generated give managers a concrete basis on which to evaluate the long-term financial strength of the business. It also facilitates an understanding of the various drivers of performance, including: the sales picture for each product line, cost trends, the viability of proposed capital expenditures, the success of marketing strategies and advertising campaigns, and many other dimensions of corporate profitability (Samuel-Johnson 2001).

Sustainability reporting has evolved swiftly from an ambitious concept to a widely adopted practice. To date, more than 3000 corporate environmental, social or sustainability reports have been published globally, on a voluntary basis (GRI, 2002; Krajnc and Glavic, 2005). Sustainability reports are emerging as a new trend in corporate reporting, integrating financial, environmental, and social performance of the company into one.

Important developments for the issue of sustainability reporting were the foundation of the World Business Council for Sustainable Development (WBCSD, 1997), the Global reporting Initiative (GRI, 2002) and the development of standards for environmental management systems, such as the ISO and EMAS standards (OECD, 2002).

Many companies are already involved in various activities aimed at addressing sustainable development, which has been defined, in the corporate context, as “the creation of goods and services using processes and systems that are non-polluting, conserving energy and natural resources, being economically viable, cultivating safety and health for employees, communities and consumers, creating or providing work that is socially and creatively rewarding for all working people” (Veleva and Ellenbecker, 2001).

Due to demands from various parties (such as customers, suppliers, employees, national regulators, banks, insurance companies, shareholders, trade associations, local community), sustainability reports are currently emerging as a new trend in corporate reporting, integrating into one report the elements of financial, environmental, and social facets of the company (GRI (2002), Woolworths Annual Report (2005), SAB Sustainable Development Report (2006).

Sustainability reports usually introduce a set of Sustainable Development indicators that can be used to measure sustainability performance of a company. They translate sustainability issues into (usually) quantifiable measures of economic, environmental, and social performance with the ultimate aim of helping address the key sustainability concerns (Azapagic, 2004) and to provide information on how the company contributes to sustainable development (Azapagic and Perdan (2000), GRI (2002), Woolworths Annual Report (2005), SAB Sustainable Development Report (2006).

The GRI guidelines are the most frequently used standard for reporting. In general, companies report in more detail on the application of environmental innovations and the environmental and social performance of their product, reflecting the product focus in the trade and retail sector.

### 5.3 The GRI Guidelines and Sustainability Assessment

The Global Reporting Initiative (GRI) sustainability reporting guidelines were developed as a way of helping organizations to report on their environmental, social and economic performance and to increase their accountability. Under this approach, known as Triple Bottom Line Reporting, the Global Reporting Initiative (GRI) sustainability reporting guidelines were developed with the aim of assisting “reporting organisations and their stakeholders in articulating and understanding contributions of the organisation to sustainable development” (GRI, 2002). The “triple bottom line” approach addresses the environmental performance, economic performance and societal performance of the company.

KPMG Advisory Services conducted a study in 2002 to assist Australian trade and retail companies with the preparation of public environmental, social or sustainability reports. The study examined 24 Australian and international trade and retail reports, discussed why companies have chosen to report, who the reports are intended for and what was reported on. Overall it was found that most of the companies provide an overview of the information outlined in the GRI Guidelines. However, very few details are provided, making it difficult to assess the level of integration of these activities and commitment to the process.

Reporting frameworks are usually targeted at informing stakeholders on performance:

- To establish a benchmark of the company's current position, goals for the future, and plans the company has to reach those goals;
- Provide assurance to internal and external stakeholders of the company's progress against its commitments and prior years' performance;
- Create a starting point for wider stakeholder consultation and involvement in the company's activities;

- Respond to the demand from stakeholders, such as the community and the financial sector, for greater accountability and transparency; and
- Meet mandatory requirements to publish separate reports or include environmental or social information in annual reports.

(KPMG, 2002)

The concept of sustainable development that underlies the guidelines such as the GRI does present some shortfalls and weaknesses that contribute to the perception that sustainable development is a simple procedure that is limited to a disclosure of sustainability information corresponding to the current year rather than the long-term integrated business view of sustainability (Moneva *et al.* 2006). Nevertheless, the GRI guidelines marked an important step in operationalising sustainable development in the corporate environment.

A major challenge for companies who aim to take sustainability seriously is to move beyond sustainability reporting into the realm of ongoing sustainability assessment.

Some authors argue that sustainability appraisal should move beyond assessing the direction and distance towards achieving sustainable development and focus instead on asking the fundamental question of whether or not a proposal or action *is* or *is not* sustainable (yes/no assessment) (Brown *et al.* 2005). This is based on the view that understanding the extent of a contribution to sustainable development but only ensuring limited progress towards this objective is insufficient to ensure that sustainable development is ever delivered.

There are a number of unanswered questions, and a certain amount of scepticism, concerning the process of sustainability assessment. The following questions indicate typical concerns:

How to measure areas that constitute sustainable development? How to put numbers or colours or other descriptors to these indicators of the quality of life or of well-being? One answer to that is, perhaps, is it needed? Another question that must be addressed is: Are there indicators that are not amenable to quantification? And, if attempts at quantifying them are made, do they fall into the same trap as economists have fallen into for the last one hundred and fifty years— that is, in believing that only things that have

numbers mean anything? (Khosla, 1995, p. 9, in Ko, 2005). But, as Ko points out “{...} little progress in sustainable development can be expected until such pessimism is overcome” (Ko 2005, p. 435). The key is to develop a protocol for assessing sustainability and to follow it consistently to ensure a comprehensive, careful, and deliberate decision-making process (Munro, 1995).

The issue of undertaking sustainability assessment is broad, and an in depth analysis of the debates on this topic is outside of the scope of this report. It was however, important to raise it here in order to highlight the fact that there are many and varied definitions of sustainability, and so it follows that there are many and varied approaches to sustainability assessment. In this report much emphasis has been placed on ensuring that the measurement tool is consistent with definitions of sustainability, as well as with the priorities and goals of the user group. A key methodological focus was creating an assessment framework that was comprehensive, and enabled careful and deliberate decision-making.

In the construction of a CSDI framework, it was considered that a company might want to use the tool for reporting results to stakeholders, but also use the tool for effective sustainability assessment, as well as the communication of the company’s sustainability information to management and decision-makers as part of an SMS. The CSDI framework in this dissertation has therefore been enabled to produce different end point representations that can be used for different purposes.

The next section outlines broad and overarching principles and criteria for the design of a sustainability assessment framework and its operationalization through a Composite Sustainable Development Indicator.

## 5.4 Principals and Criteria

The following principles and criteria have been formulated through the process of reviewing key work within the literature dedicated to assessing sustainability and composite indicators. They have been formulated from different assessments of existing methodologies. Such principles are a pragmatic expression of core values (Hardi *et al.* 1997). They serve as practical guidelines for the whole assessment process from

system design and identification of indicators, through field measurement and compilation.

The key criteria relating to the specificities of the corporate context were refined from practical experience of, and research into the nature of a corporate entity, retail and corporate sustainability dealt with in the previous chapter. Presented here is a composite set of principles and criteria which include both general and specific elements, but which are ultimately targeted at guiding our scope of work in developing an assessment framework and Composite Sustainable Development Indicator for a corporate retail context.

## **A. General Principles and Criteria**

### **1. Holistic Perspective**

- a) Must be based on a clear vision of sustainability that is
  - relevant to the reference group
  - in line with international agreements and legislative definitions
  - theoretically sound and operationally practical
- b) Must address social, economic, biophysical and institutional issues pertaining to sustainability

### **2. Adequate Scope**

- a) Must include consideration of equity, human and social well-being as well as ecosystem carrying capacity

### **3. Openness**

- a) Must provide methods for the selection, combination and communication of indicators that are accessible
- b) Judgments, assumptions and uncertainties must be made explicit

#### **4. Effective Communication**

- a) Must address the needs of the users
- b) Must use a simple structure and plain language
- c) Broad participation must be a key element of the model
- d) Must integrate participant-led and expert-led approaches

#### **5. Institutional Capacity**

- a) Must have the capacity for repeated use
- b) Must be objective's led, and provide guidance on how to set management goals for sustainable development.
- c) Must accommodate a long enough time horizon

#### **B. Criteria Specific to Corporate Sustainability**

- Must accommodate a generic corporate retail organizational structure
- Must accommodate the fundamental imperative of profit
- Must aid strategic decision-making
- Must accommodate a specific corporate identity
- Must provide for the effective communication of sustainability information to management

Such principles and criteria provide general guidance for the design of a sustainability assessment framework, which is the basis of a methodological framework for a Composite Sustainability Indicator. The next section provides an introduction into the theory of sustainability assessment frameworks and an evaluation of existing frameworks.

### **5.5 Theoretical Frameworks for Assessing Sustainability**

The field of research methodology is defined as the study of all aspects of the research process (Mouton and Marais, 1990). In the context of undertaking a specific research project, methodology is the theory and logic used to ensure that appropriate decisions are taken in planning and executing the research, to maximise the validity of findings

(Mouton and Marais, 1990, citing Kaufman, 1944). Methodology can thus be defined as the theory of method (Faludi, 1987), the theory of how to go about doing something.

Concepts are the elementary, symbolic constructions through which people classify or categorise reality, or a specific phenomenon (Mouton and Marais, 1990). Concepts that acquire meaning within a theoretical framework are termed theoretical concepts or constructs (Hill 2004, unpublished). Conceptual frameworks may be classified into three types - typologies, models, and theories - according to the function that the framework fulfils (Mouton and Marais, 1990):

- typologies have a classifying or categorising function;
- models classify but also suggest relationships, heuristically (where heuristic means to discover or reveal); whereas,
- theories fulfil the functions of classification, heuristics, and explanation - a phenomenon is explained when one can describe why it has occurred.

In social science, models have been termed precursive theoretical models to emphasise that most models are (a) theoretical and not physical or scale models, and (b) precursors to subsequent theories (Mouton and Marais, 1990, citing Gorrell, 1981). The distinction between models and theories is often vague. Models are used to simplify and abstract, whereas empirical theory explains actual relationships between phenomena for eventual testing (Hill 2004, unpublished).

In sustainability assessment discourse the term 'model' refers to a particular self-contained system of analysis that produces information about relationships of complex systems in the world, in a particular way. Thus, it is often used interchangeably with the term 'framework'. These terms, however, must be distinguished from empirical 'theories', in that they refer to classification and the suggestion of relationships, heuristically (where heuristic means to discover or reveal) for the purposes of simplification and abstraction, rather than the 'classification and explanation of a phenomenon when one can describe why it has occurred'.

In this dissertation distinction must be made between a conceptual model, and a methodological framework for a composite measurement tool. The frameworks in

sustainability assessment function much like theoretical models in that they 'classify but also suggest relationships, heuristically'. They may also be goal-orientated, which is of key concern in the realm of sustainability generally, and more specifically, sustainability assessment. Methodological frameworks provide specific methods that are based on the concepts and relationships defined in a conceptual framework. Such methods aim to enable effective measurement and communication of indicators of the concept to be measured. Methodological Frameworks assessed in section 5.7 onwards in this chapter have been created for the purposes of aggregating indicators into a Composite Sustainable Development Index, and have been assessed as measurement tools.

As the distinction between theoretical models and theories is often vague, so to is the distinction between conceptual models and methodological frameworks. The frameworks included in the following section 5.5.1 may be said to synthesize a conceptual model and a methodological framework. However, while they all include fundamental concepts, relationships and the methods for the development of indicators, they have not necessarily been created with the intention of creating a measurement tool, in the form of a Composite Sustainable Development Index. Further, they have not focused on assessing the sustainability of a corporate retail entity, except for The Natural Step. They have thus been reviewed as sustainability assessment frameworks, where the value and relevance of their theoretical concepts and the organization of fundamental relationships with regard to assessing sustainability has been emphasized.

### **5.5.1 A Brief Review of Existing Sustainability Assessment Frameworks**

Over the last decade or so there have been numerous attempts at creating theoretical frameworks for the purposes of assessing and achieving sustainability (Checkland, (1981), Bellows (1985), TNS (2004), Gunderson and Holling (2002), Prescott-Allen (2001), OECD (1993), UNCSD (2001). The discussion of assessments frameworks have been included here in order to:

- Provide a brief background theoretical review
- To incorporate some key principles that have arisen out of such comparisons
- To evaluate whether a particular framework may be appropriately suited for adaptation to our particular scope of work

### *Soft Systems Analysis (Checkland, 1981)*

Builds on systems thinking and experiential learning to develop indicators as part of a participatory learning process to enhance sustainability with stakeholders.

This starts by expressing the “problem situation” with stakeholders. Using informal and unstructured discussions on people's daily routines, as well as quantitative structured questionnaires, the approach attempts to understand the scale, scope and nature of problems in the context of the community's organisational structure and the processes and transformations that occur within it (Reed *et al.* 2006). The methods used in Soft Systems Analysis have considerable overlap with participatory tools that are often used to describe livelihood systems, such as transect walks, participatory mapping, activity calendars, oral histories, daily time use analysis and participatory video making (e.g., Chambers, 2002).

Soft Systems Analysis also provides a wide variety of participatory tools to explore “problem situations” with stakeholders. This information is then used to identify goals and strategies, which are refined from the “desirable” to the “feasible” in focus group discussions. There are also a number of approaches to goal setting from decision-making literature. This suite of approaches was used when developing the goals of a community based urban greening programme in Bangkok, Thailand (Fraser, 2002).

Such approaches can be used to provide a longer-term view of how environmental changes or socio-economic shocks affect the ‘vulnerability context’ or the way in which a community is vulnerable to external shocks (Reed *et al.* 2006).

### *Classification Hierarchy Framework (Bellows, 1995)*

Identifies indicators by incrementally increasing the resolution of the system component being assessed, e.g., element = soil; property = productivity; descriptor = soil fertility; indicator = % organic matter. This framework is discussed in more detail later in section 5.5.5.

*The Natural Step (TNS, 2004)*

Develops indicators to represent four conditions for a sustainable society to identify sustainability problems, visions and strategies. The four conditions are as follows:

Nature cannot be subjected to:

- 1) Increasing concentrations of substances extracted from the earth's crust
- 2) Increasing concentrations of substances produced by society (man-made compounds)
- 3) Degradation by physical means (damage to nature)
- 4) Unfair and inefficient practices and people's ability to meet their needs is not systematically undermined (inefficient distribution and use of resources)

The framework prescribes the process of Backcasting (Alignment of short term goals with long-term goals), that include 4 Steps of Engagement

- 1) Share awareness of the 4 system conditions
- 2) Behavioural audit
  - In what ways your current operations are most seriously violating system conditions.
- 3) Clear vision of a successful outcome
  - Imagine a sustainable society
  - Will the company be a player in such a society
  - Focus on details as well as larger differences between now and then
  - Direction – future vision requires small steps (program of actions)

*Panarchy Theory and Adaptive Management (Gunderson and Holling, 2002)*

Based on a model that assesses how ecosystems respond to disturbance, the Panarchy framework suggests that key indicators fall into one of three categories: wealth, connectivity, diversity. Wealthy, connected and simple systems are most vulnerable to disturbances.

The framework describes adaptive cycles nested one within the other, across space and time scales. It has been applied in a variety of contexts to account for the socio-economic impacts of ecological disturbances, for example, in Fraser (2003). Panarchy uses ecological pathways, or the connectivity of landscape units, to define relevant spatial boundaries. As yet there has been limited application of this approach to social systems (Reed *et al.* 2006).

#### *Well-Being Assessment (Prescott-Allen 2001)*

This framework uses four indices to measure human and ecosystem wellbeing: a human well-being index, an ecosystem well-being index, a combined ecosystem and human well-being index, and a fourth index quantifying the impact of improvements in human well-being on ecosystem health. The underlying hypothesis of the well-being assessment is that sustainable development is referred to as being equal to the sum of human well-being and ecosystem well-being, (IUCN, 1997; Prescott-Allen, 2001, p. A2-1; & Moiseev, 2001). This model was developed to apply system ideas simultaneously to the goal of maintaining or improving human and ecosystem well-being.

#### *Orientation Theory (Bossel, 2001)*

Develops indicators to represent system “orientators” (existence, effectiveness, freedom of action, security, adaptability, coexistence and psychological needs) to assess system viability and performance“. This framework helps researchers develop a conceptual understanding of relevant systems by identifying a hierarchy of systems, sub-systems and supra-systems and describing the relationships between “affected” and “affecting” systems (Bossel, 1998).

#### *Pressure-State-Response (PSR, DSR and DPSIR) (OECD, 1993)*

The Pressure-State Response Model (also referred to as the ‘condition-pressure-response model’ or the ‘stress-response model’ or the driving force-state-response model) identifies environmental indicators based on human pressures on the environment, the environmental states this leads to and societal responses to change for a series of environmental themes. Later versions replaced pressure with driving forces

(which can be both positive and negative, unlike pressures which are negative) (DSR) and included environmental impacts (DPSIR).

Early applications of Response-Models were adopted in, for example, the disaster management field (see Janis, 1954 in Hardi *et al.* 1997) and focussed on stress imposed by the environment on people. This model is driven by the recognition that stress imposed by human activity spans physical, chemical and biological attributes. It assumes that with adequate responses, the stress-induced impacts can be mitigated and/or prevented (Shippey 2001).

#### *Thematic Indicator Development (UNCSD, 2001)*

Identifies indicators in each of the following sectors or themes: environmental, economic, social and institutional, often subdividing these into policy issues. This framework is discussed in more detail below in section 5.5.3.

### **5.5.2 Assessment**

In the sphere of sustainability assessment, frameworks are often compared on the basis of a key distinguishing characteristic that enables categorization into types and reflects the emphasis of the person or group undertaking the typological assessment.

#### **5.5.2.1 Objectives-led vs. Baseline Driven**

The group who developed the Triamagram (Brown *et al.* 2005) differentiated between approaches on the basis of whether they were objectives-led or baseline-led. Their analysis argued that the net result of using baseline-led approaches tends to be a minimisation of negative impacts rather than positive contributions to sustainable development. They further argued that objective's led or goal-orientated approaches have far greater potential to contribute to what they defined as 'ideal sustainability' (see Chapter 3 for an explanation of ideal sustainability). This dissertation has emphasized the importance of goals in that it has prescribed a guiding set of corporate sustainability issues that may guide users of this framework in selecting achievable goals. Such a premise has been illustrated in Figure 4. Further, the SMS framework proposed in

Chapter 2 emphasized the setting of targets and goals as an important step within a management system.

### **5.5.2.2 Participant-led vs. Expert-led Approaches**

From their analysis which was based on a typological assessment of 'bottom-up' or participant-led approaches as compared to 'top-down' or expert-led approaches, Reed *et al.* have emphasized the importance of participatory approaches setting the context for sustainability assessment at local scales, but stress the role of expert-led methods in indicator evaluation and dissemination. More significantly, they have shown that by integrating approaches from different paradigms, research groups may offer a holistic approach for measuring progress towards sustainable development (Reed *et al.* 2006). This is a key premise on which this dissertation rests. The corporate sustainability issues included in Chapter 4 allow users of the framework to set their own sustainability goals. The methodological framework of the barometer, explained in chapter 6, and the methods adapted from the barometer in the illustrated example described in chapter 8 allow for a significant amount of freedom for users in

- a) defining the values on the performance scale,
- b) selection of indicators
- c) providing the option for users to aggregate back to a two-component sub-system level

According to Reed *et al.*, "Notwithstanding epistemological differences, it is notable that indicator frameworks from both schools set out to accomplish many of the same basic steps (Reed *et al.* 2006, p.3)."

Reed *et al.* suggest that all such models need to address 4 key issues, which have been included in our general principles. First, sustainability indicator frameworks must help those developing indicators to establish the human and environmental context that they are working in. Second, sustainability indicator frameworks provide guidance on how to set management goals for sustainable development. Third, all sustainability indicator frameworks provide methods to choose the indicators that will measure progress. Finally, in all frameworks, data are collected and analysed (Reed *et al.* 2006).

### **5.5.3 Evaluation**

All the approaches mentioned above might be considered full system models or frameworks that try to capture all aspects of the system, including people and the environment. Since the principles of this dissertation have been formulated from numerous sources, which had in themselves drawn on numerous sources, they are fairly comprehensive and quite broad in their scope. However, the criteria are quite particular in their prescriptions. None of the above mentioned frameworks met all of the principal criteria. It thus became apparent that a process of selection, combination and adaptation was required. In assessing existing frameworks a major criterion was the adaptability of a framework; the ability of the framework to

- accommodate the concept of corporate sustainability
- accommodate a retail corporate context
- be integrated with elements from other frameworks
- have the potential to meet all the principles and criteria

In this assessment it was felt that a combination of two frameworks suited the purposes of the scope of this dissertation. That is, a combination of a thematic framework and a classification hierarchy framework. Such combinations already exist within the realm of corporate sustainability assessment (Kranjc and Glavic 2005). These approaches make use of a three-pillared approach to sustainability. However, it was felt that the scope of work of this dissertation could best be accommodated by combining and integrating a thematic framework, which assesses sustainability in terms of four pillars, namely social, environmental, institutional and economic, with a classification hierarchy framework.

Particular aspects of each framework will now be discussed, with reference to how they help to fulfill the stated principles and criteria.

### **5.5.4 Multi-Component or Theme Frameworks: The four-pillared Approach**

The importance of integration in assessment practices has been acknowledged for decades. This is indicated in the original EIA requirements of the US National Environmental Policy Act (NEPA), which requires integration of natural and social

sciences. While it is debatable to what extent this has been achieved, the importance of this integration has received increasing emphasis through recent years (Brown *et al.* 2005).

Common systemic perspectives, which have been adopted to describe sustainability, include the multi-component model, the most common of which is the Three-component Model. Some examples of the indicators which reflect this approach include the Oregon Benchmark Initiatives (Oregon State Progress Board, 1992 in Hardi *et al.* 1997) Sustainable Seattle (Atkisson & Hatcher 2001) and the Environmental Sustainability Index (Samuel-Johnston 2001).

The three components include social, economic and environmental components. Sometimes there is a fourth dimension, the institutional dimension (WRI Policy Performance Measure, Hammond *et al.* 1995). There are many variations regarding which elements are included in each. Although these cognitive models indicate interaction between units, they assume nevertheless some degree of separation between people/society and the ecosystem (Shippey 2001, unpublished).

Pillar-based approaches are often criticised for emphasizing the differences between pillars as opposed to the overlap between them (Hill 2004 unpublished). It is suggested that this leads to a focus on trade-offs rather than achieving sustainability across all pillars. Integrating the pillars is a step forward from considering them in isolation, but may fail to define a process by which the objective of ideal sustainable development can be reached. It is arguable, that by failing to begin with the principles of sustainable development and focusing instead on reducing the negative impacts of a company, progress towards ideal sustainable development is not built into the process.

The lack of integration between pillars becomes problematic when decisions are made and actions are taken that are based on inaccurate and/or misleading data, resulting from misguided theory that ignores the fundamental links between society and the ecosystem. One need only look at the problem of conventional economics and GDP as a measure of national wealth/health to exemplify this issue. However, if pillars are integrated by weighting them equally within an assessment or appraisal framework, all components of the model are treated with equal significance. In cases where equal

weighting of particular indicators is impossible, providing transparent justification for the unequal significance attributed to indicators enables, at the very least, a clear understanding of the limitations and potentialities of a model.

Further, different weightings of specific indicators may be determined by the reference group, according to their own priorities with regard to the significance of how a particular indicator reflects a particular dimension of sustainability. (The issue of weighting is discussed in detail in Chapter 8).

The issue of integration across four pillars raises the question of strong vs weak sustainability. It has been shown in this dissertation that corporate sustainability falls within the ambit of weak sustainability. A weak sustainability approach to Corporate Sustainability is influenced by factors such as legislation, international benchmarks like the AA100 framework, ISO series and GRI guidelines, as well as peer pressure from rival companies, society or the investment community (Triologue, 2005). A strong level of commitment surpasses basic compliance level standards and recognizes the need to link 'responsibility' with 'opportunity' by developing a deep rooted business case for sustainability (Baumgartner, 2006)

If the components of each pillar stem from a goal orientated approach to sustainability, the commitment to sustainability by a company may be taken more seriously. It is for this reason that the key issues of corporate sustainability have been included as a guide for corporate retail institutions to achieve sustainability. In the proposed model they inform the selection of indicators within each of the four dimensions of sustainability.

### **5.5.5 The Importance of the National Legislative Context**

Irrespective of the variety of conceptualisations of sustainable development, the three pillars concept has been incorporated into South African legislation at the highest level. Section 24(b) of the South African Constitution places responsibility on the government to protect the environment for present and future generation and to "secure ecological sustainable development and use of natural resources while promoting justifiable economic and social development." All subordinate legislation must support and be implemented to realise this obligation. Sustainable development is thus a fundamental

objective entrenched in South African legislation. This goal is enshrined in the Constitution (Act 108 of 1996), the National Environmental Management Act (Act 107 of 1998) and other legislation.

While Local Agenda 21 guides the implementation of sustainable development in South Africa, no mechanisms are in place to measure and assess progress towards it. Hence there are no established regulatory indicators against which to measure the status of sustainable development at national, provincial, regional or sub-regional levels.

Environmental protection has been given increasing importance, and corporate conduct is regulated by a number of legislative instruments: the National Environmental Management Act (NEMA) (1998), the National Water Act (1998), the Biodiversity Act of 2004, the Air Quality Act (2004) – includes regulations to improve ambient air quality. Directors and other individuals within companies can be held liable for any negative impact on the environment caused by the company. Due diligence and environmental auditing are thus emerging as new trends within the corporate governance sphere.

However, if companies are to take sustainability seriously, an in road for them is to adopt goals based on the key issues of corporate sustainability. A strong commitment to sustainability in the corporate environment involves moving beyond reporting to ongoing sustainability assessment and moving beyond compliance to achieve higher sustainability goals. Thus, even though the institutional aspect of sustainability is not widely acknowledged, it is essential for companies to incorporate institutional issues within their assessment of sustainability. Adopting a four pillared approach meets the criteria of consistency with national legislative definitions, and relevance to international agreements, but also assists a company in achieving stronger sustainability.

Below is a table summarizing the key reasons for adopting a four-pillared Thematic Framework, and the corresponding principle, which it fulfills.

**Table 4.** Summary of Key reasons for adopting a four – pillared Thematic Framework and the corresponding principles they fulfil.

<b>Principle</b>	<b>Feature</b>
<b>Holistic Perspective</b>	It provides a theoretically sound conceptualisation of sustainability
	It is consistent with, and expands on legislative definitions
<b>Criteria of Corporate Sustainability</b>	It facilitates division of responsibilities among management teams
	It improves on what is currently the most widely accepted approach to defining sustainability (GRI, 2002).
	It provides a theoretical basis for a reporting output that speaks practically to a corporate entity's strategic priorities

The Thematic Pillar Approach forms the conceptual basis of the sustainability assessment framework proposed by this dissertation. However, in order to be an effective tool in constructing a CSDI it needs to be combined with an effective way of organizing indicators that facilitates sound aggregation and weighting.

### **5.5.6 Hierarchical Organization (or Classification Hierarchy)**

The second framework that will be combined with a four-pillared thematic model is a Hierarchical Organizational framework. In this framework indicators are identified by incrementally increasing the resolution of the system component being assessed. Information is organized in tiers that descend from more general concepts to more detailed sub-components of those concepts. Complex concepts or systems may be deconstructed in a meaningful way that allows for a better understanding of the dimensions, issues and indicators of those particular issues.

The reasons for the selection of this organizational framework are based on its ability to accommodate a methodology that enables the operation of a CSDI measurement tool in a way that facilitates meeting the stated principles and criteria. The following table

summarizes the key reasons for incorporating a Hierarchical Organizational framework, with the corresponding principles they fulfill.

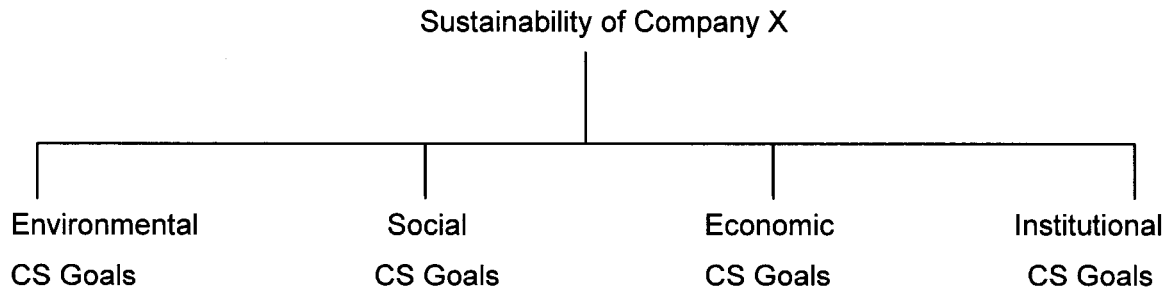
**Table 5.** Summary of Key reasons for incorporating a four – Hierarchical Framework, and the corresponding principles they fulfil.

<b>Principle</b>	<b>Feature</b>
Openness and Effective Communication	This format has been found to ease the aggregation of indicator scores as well as the integration of information on sustainable development (IUCN, 1997; Prescott-Allen, 2001; Krajnc and Glavic, 2005; Singh et al., 2006).
	Having a hierarchical organization of indicators is useful as it provides a map of the assessment process.
Institutional capacity	It allows for easy adaptation by different user groups
Principles of CS	It is conducive to strategic decision-making and management as concepts and issues are arranged in a similar way to large organizations

## 5.6 The Conceptual Basis for a Framework to Assess Corporate Sustainability

A sound theoretical framework is the starting point in constructing composite indicators. The framework should clearly define the phenomenon to be measured and its sub-components and provide methods for the selection of individual indicators and weights that reflect their relative importance and the dimensions of the overall composite (Nardo et al 2005). Ideally, this process would be based on what is desirable to measure and not which indicators are available.

A framework for assessing sustainability in a corporate environment needs to be based on the concept of corporate sustainability. In order to increase the robustness of indicators, each dimension of sustainability needs to consist of goals of corporate sustainability.



**Fig. 4.** Conceptual basis for Assessing Corporate Sustainability

Multi-dimensional concepts such as sustainability can be divided into several sub-groups, or pillars. These sub-groups need not be (statistically) independent of each other, and existing linkages should be described theoretically to the extent possible (Nardo *et al.* 2005). Such a nested structure improves the users' understanding of the driving forces behind the composite indicator (Azapagic, 2004). It also makes it easier to determine the relative weights across different factors (Nardo *et al.* 2005). (The issue of weighting is dealt with in Chapters 6 and 7). For sustainable development to be measured accurately, the measuring tool used needs to capture the important variables inherent in the concept and context.

The issues within each pillar have been tabulated in Chapter 4. What follows is a general description of the nature of each pillar, and an explanation of the theoretical relationships that exist between them.

### **Economic**

The economic dimension of sustainability concerns the impacts of the company on the economic well-being of its stakeholders and on economic systems at the local, national and global levels. Economic viability and competitiveness of a company is important for Corporate Sustainability as companies have the potential to bring various economic benefits to society, including the provision of employment and the generation of wealth (Azapagic, 2004). Economic performance encompasses all aspects of economic interactions, including the traditional measures used in financial accounting, as well as intangible assets that do not systematically appear in financial statements (GRI, 2002). Much of what is covered by the economic pillar has been discussed in Chapter 4. As *the*

main focus of a retail entity concerns cost effectiveness and profit, it may be argued that companies may want to weight indicators under this dimension more than indicators in other dimensions. However, as discussed in chapter four, and emphasized by the proposed four-pillar framework, a serious commitment to sustainability in the corporate context may only be achieved if company management considers non-economic issues as importantly as it does economic issues.

## **Social**

The social dimension of corporate sustainability reflects the attitude of the company to the treatment of its own shareholders, employees, suppliers, contractors and customers, and also its impact on society at large. Good social performance is important in ensuring the license of a company to operate over a long term (Krajnc and Glavic, 2005). However, social performance measurement enjoys less of a consensus than that of an environmental performance one (GRI, 2002). Two of the key principles of the social dimension of sustainability are equity or social justice, and opportunity redistribution on a massive scale.

As every corporate entity exists within a social matrix, and its basic activity is the provision of goods and services to the general public, all of its actions may be said to have effect individuals and groups. Such individuals and groups may have biophysical or economic priorities, and wield varying degrees of power in society and in relation to the corporate entity.

## **Environmental (or bio-physical)**

The environmental group of indicators covers impacts of the company on living and non-living natural systems, including ecosystems, land, air and water. Indicators within this dimension should be selected based on an appreciation of the limited carrying capacity of the earth's ecosystems. They should be influenced by the notion that the environment is a 'public good' that belongs to society, and as such there is legitimate public interest in the environmental footprint left by companies (Dialogue, 2005). Good corporate citizenship means internalising environmental costs and considering the observation of internationally accepted principles and embedding environmental management.

The selection of indicators that fall within this pillar may be guided by the consideration of the following best practice issues: mitigating biodiversity impacts, protecting environmental rights, enhancing product impact, responding to climate change and influencing the supplier base.

As with all the other pillars, environmental concerns overlap with the other dimensions of sustainability. Environmental issues within this pillar do not merely concern the biophysical surroundings, they concern social responsibility, and because of the current legislative environment, the possibility of financial risk.

### **Institutional**

The institutional dimension of sustainability concerns the organization and management of the issues that fall under the other three pillars. It covers the company management structures, and systems that are in place to assess, report and act on sustainability issues. Corporate governance and compliance issues fall squarely under the institutional dimension of corporate sustainability. It is the institutional dimensions of sustainability that may enable the cohesion of the other three pillars, through effective management of power and responsibility both within the company and between the company and society.

The sustainability assessment framework unfolds further in Chapter 8, where particular methodological adaptations are explained and placed in context of the selected theoretical approach to corporate sustainability.

Once the basic theoretical conceptual relationships that inform the scope of measurement have been defined for the type of index required, it is worthwhile to look briefly at existing Composite Sustainable Development Indices in terms of their methodological advantages and limitations, relative to specific principles, as well as their potential for being adapted to our particular context, i.e. a corporate retail environment. The next section will describe and evaluate some selected existing operational measurement tools, or Composite Sustainable Development Indices, and then provide a brief assessment of these in order to select and adapt a tool that best suits the stated requirements.

## 5.7 Evaluating Composite Sustainable Development Indicators

The 1992 Earth Summit states in Chapter 40 of Agenda 21 that "indicators of sustainable development need to be developed to provide a solid basis for decision-making at all levels and to contribute to a self-regulating sustainability of integrated environment and development systems" (United Nations, 1992). This implies that if sustainable development is to be achieved at a company level, organisations must seek practical and theoretically sound indicators to evaluate their performances and impacts with respect to sustainability.

In general terms, an indicator is a quantitative or a qualitative measure derived from a series of observed facts that can reveal relative positions (*e.g.*, of a company) in a given area, and over a certain period. When evaluated at regular intervals, an indicator can point out the direction of change across different units and through time. In the context of policy analysis, indicators are useful in identifying trends and drawing attention to particular issues. They can also be helpful in setting policy priorities and in benchmarking or monitoring performance. A composite indicator is formed when individual indicators are compiled into a single index on the basis of an underlying model (Nardo et al 2005). The composite indicator should ideally measure multi-dimensional concepts that cannot be captured by a single indicator alone, *e.g.*, competitiveness, industrialisation, and sustainability. The concept to be measured within our scope of work is corporate sustainability.

On the dispute whether composite indicators are good or bad as such, it has been noted:

"The aggregators believe there are two major reasons that there is value in combining indicators in some manner to produce a bottom line. They believe that such a summary statistic can indeed capture reality and is meaningful, and that stressing the bottom line is extremely useful in garnering media interest and hence the attention of policy makers. The second school, the non-aggregators, believe one should stop once an appropriate set of indicators has been created and not go the further step of producing a composite index. Their key objection to aggregation is what they see as the arbitrary nature of the weighting process by which the variables are combined." (Sharpe, 2004)

According to other commentators:

"[...] it is hard to imagine that debate on the use of composite indicators will ever be settled [...] official statisticians may tend to resent composite indicators, whereby a lot of work in data collection and editing is "wasted" or "hidden" behind a single number of dubious significance. On the other hand, the temptation of stakeholders and practitioners to summarise complex and sometime elusive processes (e.g. sustainability, single market policy, etc.) into a single figure to benchmark country performance for policy consumption seems likewise irresistible." (Saisana *et al.* 2005).

Below is Table 6, a table adapted from (Nardo *et al.* 2005), summarizing the Pros and Cons of Composite Indicators.

**Table 6.** Summary of Pros and Cons of Composite Indicators

Pros	Cons
<ul style="list-style-type: none"> <li>• Can summarize complex or multi-dimensional issues in view of supporting decision-makers.</li> <li>• Easier to interpret than trying to find a trend in many separate indicators.</li> <li>• Facilitate the task of ranking companies on complex issues in a benchmarking exercise.</li> <li>• Can assess progress of companies over time on complex issues.</li> <li>• Reduce the size of a set of indicators or include more information within the existing size limit.</li> <li>• Place issues of company performance and progress at the centre of the policy arena.</li> <li>• Facilitate communication with general public (i.e. citizens, media, etc.) and promote accountability.</li> </ul>	<ul style="list-style-type: none"> <li>• May invite simplistic policy conclusions.</li> <li>• May be misused, e.g., to support a desired policy, if the construction process is not transparent and lacks sound statistical or conceptual principles.</li> <li>• The selection of indicators and weights could be the target of political challenge.</li> <li>• May disguise serious failings in some dimensions and increase the difficulty of identifying proper remedial action.</li> <li>• May lead to inappropriate policies if dimensions of performance that are difficult to measure are ignored.</li> <li>• May send misleading policy messages if they are poorly constructed or misinterpreted</li> </ul>

Although it makes sense to base assessments on indicators, it is often difficult to make good business decisions based on a large number of separate indicators (Krajnc and Glavic, 2005). Each indicator can only show what is happening to the particular issue or

sub-issue it represents, and unless the different indicators are organized and combined in a coherent manner, the information they send out is likely to be highly confusing (IUCN, 1997, p.2). The use of a Composite Sustainability Index (CSDI) thus provides a framework for decision makers to link the many sustainability issues together and reduce the number of decision-making criteria to be considered in the process (Adapted from Krajnc and Glavic, 2005).

Composite indicators can send misleading policy messages if they are poorly constructed or misinterpreted (Nardo *et al.* 2005). Their 'big picture' results may invite users (especially policy makers) to draw simplistic analytical or policy conclusions. Instead, composite indicators must be seen as a starting point for initiating discussion and attracting public interest. Their relevance should be gauged with respect to constituencies affected by the composite index. The justification for a composite indicator lies in its fitness to the intended purpose and the acceptance of peers (Rosen, 1991). This dissertation aims to contribute to a better understanding of the complexity of composite indicators and to an improvement of the techniques currently used to build composite indicators

## 5.8 Developing a CSDI for the Corporate Retail Sector

In recent years, international research has focused on the development of composite indicators mostly for cross-national comparisons of economic, social, environmental and/or sustainable progress of nations in a quantitative fashion (e.g. IUCN (1997), Krajnc and Glavic (2005), Atkissen and Hatcher (2001), Niemeijer (2002), OECD, WON, HDI, WDI, ESI, EF). Despite the indices developed, there is still no useful method available for integrated sustainability assessment on the company level (Krajnc and Glavic, 2005).

To meet the challenges of sustainability, an approach for integrated assessment of a company is required to provide good guidance for decision-making. It has been foreseeable that aggregation of indicators to sustainability indices could provide a chance for new policy guiding instruments and better integration of decision-making, as well as public participation in sustainability discussion (Krajnc and Glavic, 2005).

Although the common principle to aggregate indicators in assessing the sustainability of a company has gained acceptance, it has also become evident that methods for the aggregation of indicators are either not sufficiently well established yet, or are under development, or are not available with respect to all the sustainability aspects (Krajnc and Glavic, 2005). As the credibility of aggregation methodologies is of crucial importance for the quality of new information categories, more research is needed on the aggregation methodologies and on the relevance of basic data for comprehensive assessments (Statistics Finland, 2003).

Thus, a complex problem still exists in the aggregation of different indicators into a properly constructed index, which would enable quick and efficient assessment of sustainability of a company as well as benchmarking of companies within a particular sector (Krajnc and Glavic, 2005). Integrated information on sustainable development of a company is essential for decision-making since it is very difficult to evaluate the performance of the company on the ground of too many indicators.

Although many popular SDIs propose their frameworks and methods in ways that allow adaptation for differing contexts (Bellagio Principles: Hardi *et al.* 1997, Barometer of Sustainability: Prescott – Allen (2001), OECD Guidelines: Nardo *et al.* 2005) there is not much guidance on exactly how to go about adapting the tools for the particularities of a corporate context. Of course that may be asking a great deal from any group or person developing a composite SDI. However, people interested in adapting an existing SDI framework and methodology (which is a new discipline in itself) for a corporate context, need to employ a certain degree of innovation.

## 5.9 Assessment and Comparison of Measurement Tools

A major challenge in attempting to adapt existing SDI frameworks and methods for a corporate context is that most have been aimed at social groups who share a common geographical/political and or economic context, and therefore cover a significantly larger geographical area than for a particular company, eg. cities, municipalities, conservation areas, national governments. Very few have been specifically designed to measure the sustainability of a corporate entity, or more specifically a retail entity, whose core purpose and founding organisational principles are based on profit. Thus it was

important to identify what the particular interests, activities and values of a corporate retail entity are, and how these will influence the adaptation of an existing framework and methodology.

One way to do this is to select an existing model, and check if any of its essential core assumptions or constructions is in conflict with any core organisational characteristic of a corporate retail entity. This should be done in such a way and to such a degree that the model is shown up to be either appropriate or inappropriate for measuring sustainability in that retail context. Thus another key issue is highlighting the key sustainability concerns which apply directly and particularly to a corporate retail entity. These have been discussed in Chapter 4, and have been compressed into key principles of operationalising corporate sustainability, which are listed in Figure 3, Chapter 4. In the following sections a number of existing Composite Sustainable Development Indicator frameworks have been compared, focussing on their advantages and disadvantages, as well as their suitability for adaptation to a corporate retail context.

## 5.10 Relevant Existing Composite Sustainable Development Indices

Comparing and contrasting the key characteristics of existing operational tools not only allows the opportunity for the creation of a model that is relevant and credible, it also provides us with key insights into the theoretical foundations and methodological advances required to create an appropriate and effective tool for assessing the progress of institutions toward sustainability, and thus the achievement of sustainability itself. A major reason for including this comparative assessment is in order to provide sound reasoning for the selection of a methodological framework that will serve as the skeleton for the creation of a new adapted operational framework ideally suited to the requirements of a corporate retail entity.

### **5.10.1 General Composite Sustainable Development Indicators**

#### *The Environmental Sustainability Index (ESI)*

The ESI project aims to establish a single indicator for national environmental performance in the same way GDP provides a summary measure of economic results. The environmental sustainability index was first developed in 1999 by the World Economic Forum's Global Leaders for Tomorrow Environment Task Force, the Yale Centre for Environmental Law and Policy (YCELP), and the Columbia University Centre for International Earth Science Information Network (CIESIN). Subsequent updates were released in 2001, 2002 and 2005. Data used for this study were based on the 2002 update.

The Environmental Sustainability Index (ESI) is a composite index targeting environmental, socio-economic, and institutional indicators as a means to assess sustainability. The ESI incorporates 20 indicators, each of which combines two to eight variables, for a total of 68 underlying datasets. The core components of the ESI include: environmental systems, reducing stresses, reducing human vulnerability, social and institutional capacity, and global stewardship (World Economic Forum, 2002).

The index includes a selection of variables which are already widely collected, and which ensures comparability between regions. The selection of five focus areas make a good attempt at integrating human, social and ecosystem functions. They are as follows:

- Environmental systems: air, water and soil
- Stress on environmental systems
- Human vulnerability: loss of food, shelter and exposure to disease
- Social and institutional capacity: ability to deal with flux
- Global stewardship: ability and willingness to co-operate in collective efforts to preserve global resources e.g. biodiversity conventions

The ESI is calculated by taking the average of 22 indicators across into 5 focus areas. These are then converted to a standard normal percentile for each of the five focus areas given above (Samuel-Johnston, 2001)

The ESI reflects an effort to build a capacity for the same sort of data-driven analysis and comparative performance evaluation in the environmental domain, as exists in performance measurement and tracking within corporate entities (Kranjc and Glavic, 2005). However, the calculations are highly advanced and difficult to understand, and its methodology has been thoroughly critiqued for ignoring local contextual issues. This index generally falls prey to the shortcomings inherent in top down approaches, whereby the principles of communication and institutional capacity have not been adequately upheld.

*The Triamagram SDI for the Knersvlakte (Brown et al. 2005)*

The Triamagram is a construct developed to represent the three pillars of sustainable development, namely economic, social and environmental. A scale is drawn from each outer corner of the Triamagram to its centre, representing the pillars of sustainable development. The centre-point represents the simultaneous achievement of ideal sustainable development on all pillars. The centre-point is considered a win-win-win situation and is the goal of efforts towards sustainable development.

The area of the triangle representing of the status of sustainable development and that of the entire Triamagram can be used to create an index of the status of sustainable development. A large current status triangle is indicative of relatively poor progress towards sustainable development and a smaller triangle indicates achievement closer to ideal sustainable development. This index has little meaning in and of itself, but can be used to compare the status of sustainable development either between contexts, or of the same context at two different points in time (such as before and after a protected area is established).

While this SDI is very specific in its attempt to measure sustainability within a conservation context, it has been included here because of its methodological developments. The Triamagram's methodology considers a range of conservation alternatives and subjects them to sustainability appraisals, in order to select the most suitable model for conservation. It also attempts to develop a sustainability appraisal methodology appropriate for comparing nature conservation alternatives in a South African context.

While the Triamagram framework made numerous methodological advancements, it was insensitive to the institutional dimensions of sustainability. This is a key criticism as the achievement of sustainability depends on the balance of power with the state, within institutions themselves, and between institutions and the people and environment they affect. Four economic sectors and 3 issues at the core of the assessment methodology are contextually specific and significantly different to those of a corporate entity

#### *The Barometer of Sustainability*

The Barometer of Sustainability ("The Barometer") was developed in 1997 by the International Union for Conservation of Nature and Natural Resources (IUCN) under the supervision of Robert Prescott-Allen, who later demonstrated its practicality in his book called; "The Well-being of Nations".

The Barometer is a sustainability assessment tool that can be used to logically organize and combine indicators. It allows for the collection of disparate sustainability information and enables broad conclusions to be drawn from the often confusing and contradictory information accumulated by the plethora of sustainability indicators. It also allows the outputs to be compared through the use of a homogeneous scaling system and provides an easy way of communicating the conclusions visually (IUCN, 1997, pp. 1-4; Prescott-Allen, 2001, p.20; Guijt and Moiseev, 2001).

\*This model is discussed in detail in the following chapter

### **5.10.2 Existing Corporate CSDIs**

#### *Krajnc and Glavic's Model*

The model proposed by Krajnc and Glavic (2005) organizes sustainability assessment of the company in terms of economic, environmental, and social performance. It uses normalized social, environmental, and economic indicators to incorporate them into a unique measure of performance. The model reduces the number of indicators by aggregating them into a composite sustainable development index. For each group, indicators whose increasing value has a positive *impact* and indicators whose increasing value has a negative impact in the perspective of sustainability are considered. The

authors have applied the methodology to a company with a widely diversified product portfolio.

Like many other composite models, this model is based on a hierarchical schema (where more generalized elements are broken down into more specific sub-elements and then aggregated back again). It is also based on using the Three Pillar Approach. However, the methodology is encumbered by the requirement of complicated mathematical calculations, which may not be attractive or accessible to retail business management. It also does not address the institutional component of sustainability.

### 5.11 Assessment: Analysis and Comparison of Existing CSDIs

In attempting to create a CSDI for a corporate retail context it was necessary to investigate existing operational models. The analysis was aimed at clarifying whether an existing model could simply be selected and adapted for the purposes of this dissertation or whether an entirely new model needed to be created. The result was essentially a combination of the two outcomes.

Table 7 compares the general advantages and disadvantages of the selected relevant CSDI models based on the above-mentioned criteria. It also assesses the adaptability of the CSDI to accommodate a corporate retail context.

### 5.12 Discussion and Assessment

It was not within the scope of this report to include an in depth analysis of each tool. Our purpose in comparing existing CSDIs was to ascertain the key and most salient and relevant features of the more prominent tools of this kind in the world today in such a way that it

- a) Helped inform our own theoretical and methodological constructions
- b) Did not obscure the essential nature of each model

Following Shippey (2001) the research group applied the principles and criteria mentioned at the beginning of this chapter in order to rate various SDI models.

The ratings given by the number of stars are indicated for each model. Scores are based on the research group's opinions regarding the extent to which each SDI met the aforementioned criteria. The scores depict an average of the individual scores given by each member of the research group.

**Table 8.** Comparative Evaluation of existing CSDI tools

<b>Index</b>	<b>Holistic Perspective</b>	<b>Adequate Scope</b>	<b>Openness</b>	<b>Effective Communication</b>	<b>Institutional Capacity</b>	<b>Suitability for adaptation to corporate retail context</b>
ESI	***	*	**	***	**	*
Triamagram	***	**	****	***	***	*
Barometer of Sustainability	****	***	****	****	***	***
Krajnc and Glavic's Model	***	***	**	**	**	***

\*\*\*\* Excellent

\*\*\* Good

\*\* Fair

\*Poor

### 5.13 Selection of the Barometer of Sustainability

Specific aspects of the Barometer of Sustainability were found to comply most successfully with the principles and criteria applied in the comparison above. The methods employed by the barometer form the basis of the model proposed in this dissertation, with some adaptations made to accommodate the aforementioned conceptual basis of a four-pillared thematic model and a hierarchical organizational format, as well as the stated principles and criteria.

The most significant methodological aspects of the Barometer have been highlighted by Shippey (2001). They have been arranged under the principles they fulfil.

**Table 9.** Methodological Aspects of the Barometer that fulfill certain principles of sustainability assessment

<b>Principle</b>	<b>Method</b>
Holistic Perspective	Assess an organization's progress toward sustainability through the systematic integration of economic, biophysical and social health indicators.
Adequate scope	A performance scale needs to be set for each indicator so that the units in which the indicator was originally measured, can be converted to a performance rating on a barometer point scale. The indicator measurements are then equivalent and can be mathematically manipulated.
Openness	Key requirement of an indicator for the barometer is determination of group preferences, based on values ranging from desirable to unacceptable. Scale is set by defining the best and worst values for the indicator (end points based on experience in recent years). This requires explicit statement of assumptions about the significance of the indicator for human or ecosystem well-being.
Institutional Capacity	Barometer allows complete flexibility in setting the scales for determining performance. It allows the reference group to specify: <ul style="list-style-type: none"> <li>- The end points only, meaning that the values are equally distributed between these points – this would be known as an uncontrolled scale.</li> <li>- Only one or two sectors, and the others are equally distributed, this is a partially controlled scale</li> <li>- Determine each of the sectors individually, which is called a fully controlled scale</li> <li>- Weighting is undertaken by the reference group</li> </ul>
	Does not make use of complicated mathematical methods or formulae
Principles of CS/adaptability for a corporate context	Does not require complicated mathematical methods or formulae

The Barometer also enables the operationalisation of the selected and combined conceptual frameworks - a four-pillared thematic model that uses hierarchical organization. The three key methodological features – 1. Equal weighting of people and the ecosystem, 2. A performance scale, and 3. Ease of use, do not conflict with a four – pillared thematic framework for assessing sustainability. Further, it already incorporates a hierarchical organizational structure. The key adaptation that has been made is the incorporation of a four-pillared thematic model and the development three radar charts which have replaced the two axis graphical representation. Other key reasons for selecting the barometer are summarized as follows:

- It is a logical and practical approach to compartmentalizing sustainability issues for their identification and management.
- It is easily adapted from the common triple bottom line approach, which is currently used in many corporate organizations for reporting purposes.
- It is a mechanism that encourages strategic decision-making and informs managers and decision makers about areas of the company that are performing well or are under-performing with respect to sustainability.
- It has the ability to allow for adaptive management.

As will be shown in the following chapters, the barometer's specific methods allow the creation of an integrated and functional CSDI, which can be used in the corporate environment. The following chapter will provide a brief review of the barometer, providing a wider expression of its origins and key methodological principles.

# Chapter 6

## 6. Review of the Barometer of Sustainability

This chapter reviews the Barometer of Sustainability in order to provide a wider expression of its origins and basic methodological principles. It begins with a brief discussion of the origins of the barometer, and the reasons for its creation. The methodological principle of a Performance Scale is justified, followed by a discussion of the methodological implications of the principle of the Equal Treatment of People and Ecosystem. The chapter then moves into a brief explanation of more specific key methodological applications i.e. the 'five sector scale' and 'ease of use'. The hierarchical organization of the barometer is then introduced. The key steps required for applying the barometer in a sustainability assessment are outlined and then discussed in detail, with explanations of the specific methods it employs.

### 6.1 Origins of the Model

The Barometer of Sustainability (The Barometer or BOS) was developed in 1997 by the International Union for Conservation of Nature and Natural Resources (IUCN) under the supervision of Robert Prescott-Allen, who later demonstrated its practicality in his book called; *The Well-being of Nations*, (2001).

The Barometer was originally developed for measuring the sustainability of large projects at the regional, national, provincial or municipal geographical levels. This broad approach is not specific to the Barometer; other well-established international frameworks for assessing sustainability are also focussed on looking at how different nations are performing with regards to sustainable development (Krajnc and Glavic, 2005; Guijt & Moiseev, 2001). Despite the indices developed, there is still no useful method for integrated sustainability assessment at the company level (Krajnc and Glavic, 2005). Due to the flexible nature of the barometer of sustainability, it seems possible to adapt it to measure the progress of sustainability at smaller scales. One of the key reasons for this is its ability to combine indicators with performance values and the ease with which these values can be interpreted into meaningful information for decision makers.

The Barometer is a sustainability assessment tool that can be used to logically organize and combine indicators. It allows for the collection of disparate sustainability information and enables broad conclusions to be drawn from the often confusing and contradictory information accumulated by the plethora of sustainability indicators. It also allows the outputs to be compared through the use of a homogeneous scaling system and provides an easy way of communicating the conclusions visually (IUCN, 1997, pp. 1-4; Prescott-Allen, 2001, p.20; Guijt and Moiseev, 2001).

This study aims to adapt the well-established international operational framework of the Barometer of Sustainability as a methodological framework for developing a practical CSDI within a retail context. This broad based framework however requires considerable adaptation in order to relate it to a retail environment and make it practical and applicable to company specific agendas.

The Barometer provides an excellent methodological framework as a basis for an adapted methodology for the construction of a CSDI. The following sections will explain specific methodological aspects of the CSDI framework.

## 6.2 A Performance Scale for Combining Indicators

Since indicators measure completely different things, combining them in a way that communicates meaningful information may be like combining apples and oranges. This means that in order to effectively combine indicators, a common unit is needed that does not distort what people's value of apples or oranges is (IUCN, 1997, p4).

It has become apparent that traditional methods such as the Gross Domestic Product (GDP) standard, has failed to address issues inherent in the sustainability concept because it uses money as the basis of measuring progress (Farsari and Prastacos, 2006; IUCN, 1997, p4; Trialogue, 2006, p22). Thus the GDP's presentation of a situation where economic growth is perceived as being the ultimate driver of sustainable development is misleading in this regard (Wilson *et al.* 2006). It is imperative to realize that money is only good at measuring things that are traded in the market, while distorting the value of things that are not traded. That is, money can only reflect the market prices of apples and

oranges but not their taste, nutritional content or cultural values (IUCN, 1997, p4). In the case of sustainable development most of the issues and indicators often have no market value at all (e.g. clean air; human life; species, cultural heritage), thus an alternative to money will be needed to measure success in this regard (IUCN, 1997, p.4).

A number of weighting techniques exist. Some are derived from statistical models, such as factor analysis, data envelopment analysis and Unobserved Components Models (UCM) or from participatory methods like Budget Allocation (BAL), Analytic Hierarchy Processes (AHP) and Conjoint Analysis (CA) (Nardo *et al.* 1997). No matter which method is used, weights are essentially value judgements. While some analysts might choose weights based only on statistical methods, others might reward (punish) the components that are deemed more (less) influential depending on expert opinion, reference group preferences or a combination of both, in order to better reflect the policy priorities or theoretical factors.

An alternative to statistical normalisation methods is the performance scale which is a type of scale that measures how good an apple is at being an apple and how good an orange is at being an orange (IUCN, 1997, p.4). With a performance scale, Best and Good are defined at one end of the scale while Worst and Bad are defined at the other end, and the position of the indicator is plotted on the resulting scale (IUCN, 1997, p.4). If users of the Barometer framework wish to incorporate an additional weighting system to emphasize the relative significance of indicators, the performance scale allows for complete freedom for users to apply whichever weighting system they desire.

An advantage of using a performance scale is that it allows the user to use whatever measurement is most applicable to the issue under study. For example, employment is measured in jobs, water quality in quality of nutrients (e.g. nitrogen and phosphorus). Users can then define what are good and bad unemployment rates, and unacceptable pollution levels. The results are then presented as a set of performance measurements based on a homogenous scale, allowing them to be combined into more composite measures (IUCN, 1997, p.5).

An important characteristic, which could be interpreted by some users as a weakness of a performance scale, is that it is only good at combining indicators to which one can attach a performance value. In other words, only those indicators that can be given values that are

desirable, acceptable or unacceptable with respect to human and ecosystem wellbeing are used, while indicators of neutral or unknown significance are excluded (IUCN, 1997, p.6). This does not necessarily imply that such indicators must be left out of the assessment altogether because, by defining values for these types of indicators, one can shed more light onto the assessment (IUCN, 1997, p.6). In situations where some important issues are dropped because indicators that best represent them cannot be allocated performance values, users of the assessment must be made aware of the issues that are not included e.g. safety warnings, accident descriptions (IUCN, 1997, p.6).

Setting a performance scale by defining good and bad may strike some people as being subjective; but it is in fact no more subjective or objective than attaching any other measurement method (IUCN, 1997, p.5). The absence of an “objective” way of determining weights and aggregation methods does not necessarily lead to rejection of the validity of composite indicators, as long as the entire process is transparent. The modeller's objectives must be clearly stated at the outset, and the chosen model must be checked to see to what extent it fulfils the modeller's goal.

The advantage with a performance scale in this case, is that it is transparent and makes explicit what people think are good levels or unacceptable levels and improves the understanding of the nature of sustainable development (IUCN, 1997, p.5).

### 6.3 Key Features of the Barometer

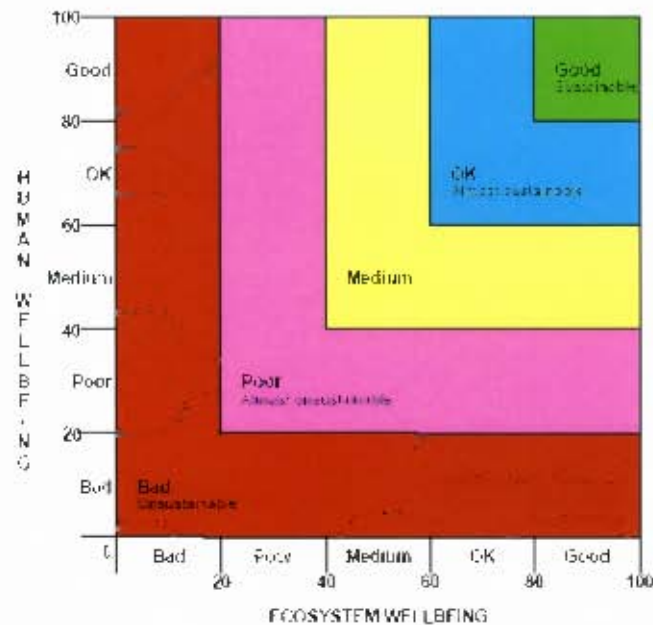
When assessing sustainability issues at the company level, or any other level, it is important to ensure that practical methodologies are employed. If a practical approach to sustainable development is not adopted, it is very likely to become a mere slogan rather than an operational objective within an organization, as pointed out by Ko (2005).

The need for a practical methodology to measure sustainability is one of the key objectives of this study and formed one of the major selection parameters for deciding on a specific CSDI framework. The Barometer was selected for this dissertation largely on this basis. It is also one of the key motivations behind the need to adapt the Barometer from its current

form to a more practical approach to measuring and displaying sustainability information within the business environment.

The following key features of the Barometer make it a flexible performance scale (IUCN, (1997), p.7-9; Prescott-Allen (2001), pA2-6; Guijt & Moiseev (2001), p17).

### 6.3.1 Equal Treatment of People and the Ecosystem



**Fig. 5.** The Barometer of Sustainability Scale. *Diagram Source: Guijt and Moiseev (2001)*

The Barometer treats people and the environment as equally important subsystems. This notion conforms to the underlying hypothesis of the well-being assessment where sustainable development is referred to being equal to the sum of human well-being and ecosystem well-being, (IUCN, 1997; Prescott-Allen, 2001, p.2-1; Guijt and Moiseev, 2001). The reason the Barometer of Sustainability considers well-being of people and ecosystem together, but measures them separately, is to reflect the view that people and the ecosystem are equally important and that sustainability is a combination of human well-being and ecosystem well-being (IUCN, 1997, p.8; Prescott-Allen, p.2-1; Guijt and Moiseev, 2001; Ko, 2005, p436). The Barometer scale has two axes (Figure 5), one for human wellbeing, and the other for ecosystem wellbeing. This makes it possible for each

set of indicators to be kept separately, and combined independently in a way that permits the analysis of people, and ecosystem interactions. It also ensures that achieving progress in the human wellbeing does not disguise a decline in ecosystem wellbeing or vice versa (IUCN, 1997, p.8).

In other words, people and the ecosystem are the two main components of the Barometer framework and through its hierarchical system; it links all other aspects of sustainability to these two subsystems. However, in order for the barometer to speak more practically to a corporate environment, its two-component axis, which forms the final field of measurement and representation, requires a certain degree of adaptation.

A weakness of the barometer framework is that its final representational output does not provide an indication of how an organization is performing in terms of the four dimensions of sustainability. It is arguable that each of these dimensions is based on the relationship between the ecosystem and humans, which the barometer propounds. In the view of the research group there is no significant theoretical contradiction between understanding sustainability as the achievement of sustainability within and across each of the four-pillars, with the concept of sustainability as achieving a balance between ecosystem and human well-being. It is also possible to merge both theoretical conceptions of sustainability so that the dimension level merely reflects a more detailed deconstruction of the complex concepts of ecosystem and human well-being. Chapter 8 provides an illustrative example of how this adapted methodology can be applied.

It is largely an issue of representation and interpretation. In a corporate environment, managers and personnel responsible for strategic decision-making with regard to the management of sustainability would benefit more from a detailed thematic final representation. The two-axis output of the barometer, while comprehensive in its scope, is too simplistic in its communication of the key areas of sustainability.

Thus, while this dissertation has emphasized a four-pillared approach to sustainability, this theoretical conceptualization of the four dimensions of sustainability – social, environmental, economic and institutional - have replaced the requirement of a system and subsystem of the barometer framework. While the two subsystem components may be included in another adaptation of the framework, the emphasis for the scope of work of

this dissertation has been placed on the reporting advantages of theoretical conception of sustainability that may be represented at a four-pillared dimension level. The hierarchical framework has thus been enabled to produce figures and maps at the dimension level and may be aggregated back to the two-component sub-system level of measurement if desired.

The two other key features of the barometer may be functionally combined with a four-pillared conceptual basis, and three-part graphical representation.

### **6.3.2 Five-Sector Scale**

The Barometer's scale is divided into five flexible sectors (good, ok, medium, poor and bad) that give its users an unusual degree of flexibility, unlike some other performance scales where only the end points are defined (IUCN, 1997, p.8; Prescott-Allen (2001); Guijt and Moiseev (2001).

The five-sector scale provides users with an opportunity to control the entire scale and the ability to define not just the end points of the scale but the intermediate points of the scale as well (Prescott-Allen, 2001, p.5). This method will be expanded upon in Chapter 7.

### **6.3.3 Ease of use**

To convert the score of an indicator to the Barometer's scale involves making simple calculations and this makes it a very user-friendly performance measurement tool. Formulae only accessible to people trained in statistics or sophisticated mathematical methods have been deliberately avoided so as to make the tool easy to use by a wide range of users (IUCN, 1997, p.9). This feature of the Barometer of Sustainability is particularly important considering that one of the policy objectives of sustainable development, and a key principle of an assessment framework is to communicate information clearly to stakeholders rather than using complicated statements, which few people understand (Ko, 2005, p.434).

This feature enables the fulfilment of the key principles of corporate sustainability, as well as the principles of institutional capacity and effective communication stated in chapter 5.

## **6.4 Organization of the Barometer of Sustainability Scale**

The Barometer organizes indicators in a hierarchical framework (IUCN, 1997, p.11). This method of organizing indicators hierarchically is also used in many other performance-measuring tools because it provides a map of the assessment process, and serves to show explicitly what assessment factors are or are not being considered in the assessment process (Hodge, 1996; Ko, 2005, p438; Singh *et al.* 2006). This format has been found to ease the aggregation of indicator scores as well as the integration of information on sustainable development (IUCN, 1997; Prescott-Allen, 2001; Krajnc and Glavic, 2005; Singh et al., 2006).

In order for the theoretical conceptualisation of sustainability as the 'sum of human and ecosystem well-being' to be operationalised the Barometer requires that the hierarchy be made up of at least two categories; the first called system, which is the scope at which the assessment is focused on e.g. corporate entity, municipality, nation. In this dissertation the sustainability of the corporate entity itself is designated as the system. The replacement of the two-component sub-system requirement has already been explained in section 6.3.1.

Note\*. The following diagrammatic representation of a corporate indicator hierarchy includes the two-component subsystem.

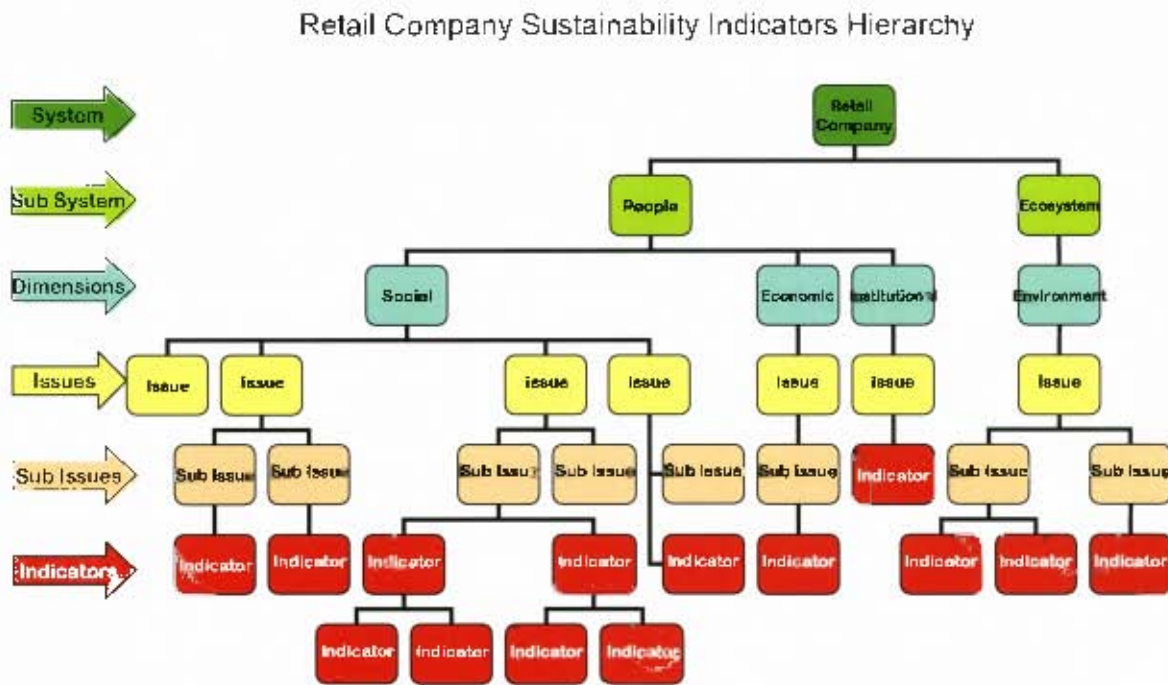


Fig.6. A conceptual example of a corporate indicator hierarchy.

## 6.5 Step by Step Procedure for a Corporate Sustainability Assessment

The following ten steps in this section were followed in order to adapt the BOS for use as an assessment tool by a company:

1. **Identify the system:** The concept to be measured.
2. **Identify the sustainability dimensions:** e.g. economic, environmental, social and institutional components of sustainability.
3. **Identify the main issues and sub-issues:** The key concerns that must be considered to get an adequate sense of the state of each dimension.
4. **Identify the sustainability indicators:** Identify the measurable aspects of each issue and sub issue.
5. **Setup a performance scale for each indicator:** Clearly define the standards of achievement for each indicator.
6. **Correspondence of values on each indicator performance scale to points on the BOS scale.**
7. **Combining/aggregate indicator scores.**
8. **Develop corporate sustainability assessment maps.**
9. **Review results and propose policies.**

## **10. *Extend sustainability Assessment over time***

The above steps are from Prescott-Allen (2001) and Ko (2005), and have been adapted for use in a corporate sustainability context.

These steps are now discussed in more detail.

### **6.6 Identify the System**

When measuring corporate sustainability, it is imperative to acknowledge that human beings are not separate entities but part of the natural world: with the responsibility to care for it for their own long term benefit and for the benefit of other organisms as well (WCED, 1987; Mannion & Bowlby, 1992; Ko, 2005). For these reasons, the first step in measuring sustainability should be the identification of the system and its sub-components respectively (IUCN, 1997; Prescott-Allen, 2001; Ko, 2005). At the level of corporate sustainability, the system is the sustainability of a company for which the assessment is being done, and its sub-components are the four-pillars of sustainability.

The goals for the system should enclose a vision of sustainability and provide the basis for deciding what the assessment will measure (Prescott-Allen, 2001). Assessment participants themselves define these goals. This dissertation has highlighted some key issues of corporate sustainability, which may provide some guidance for a company wishing to define its own sustainability goals and objectives in a way that allows for a certain degree of freedom, while at the same time prescribing a direction that speaks to the dimensions of stronger sustainability.

### **6.7 Identify the Sustainability Dimensions**

This step requires identifying the different dimensions on which corporate sustainability is based. Many experts in this discipline support this step by expressing that it is much easier to identify and organize the indicators specific to the main issues by first of all identifying the dimensions (Prescott-Allen, 2001; Ko, 2005; Nardo et al 1997; Reed et al 2006).

Dimensions could be referred to as conceptual boxes that accommodate different issues common to corporate institutions, e.g. economic, environmental, social, and institutional. Thus, dimensions should be sustainable in themselves in order for sustainable development at the corporate level to be achieved.

This step is an important component of the methodological framework. Chapter 5 has provided the basis for the selection and adaptation of a four-pillared approach to sustainability in a corporate context.

## 6.8 Identify the Main Issues and Sub-issues

The issues are the key concerns that must be considered to get an adequate sense of the state of each dimension (Prescott-Allen, 2001). Here, participants in the assessment decide which aspects of the dimensions are to be measured by identifying the significant issues. It is important to note here that because a large number of issues will be involved, participants should choose a number of key issues for each dimension. This is because, the fewer the issues the clearer their role and the stronger their influence on the dimension index (Prescott-Allen, 2001, p.2-3).

Once the issues are chosen, the scope of the data required for the indicators will be evident (Prescott-Allen, 2001, p.2-4). At this point in time, it is necessary to compile a meta-database i.e. an inventory of sources of data on each issue including when and how the data are collected, where and how stored, and how they can be obtained – essential information for the choice of indicators (Prescott-Allen, 2001, p.2-4).

## 6.9 Identify the Sustainability Indicators

This step requires the identification of the main Corporate Sustainability indicators for each of the different issues or sub-issues identified in the previous step. The indicators may be identified through a process of combining expert opinion or consultation of extensive literature studies on impacts of the issues concerned (Ko, 2005), with reference to group preferences.

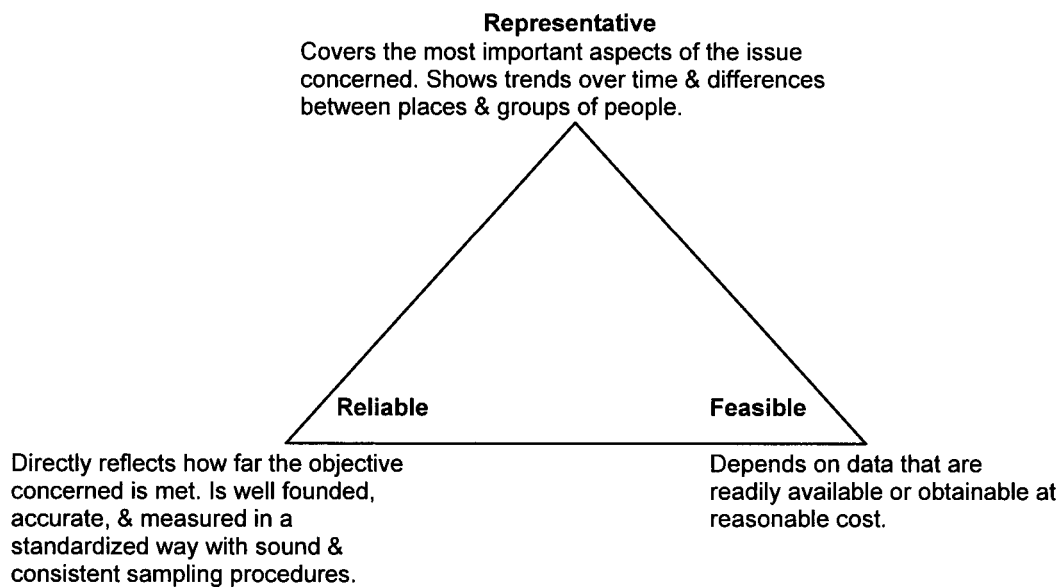
It is important to note at this stage is that there are no specific criteria for choosing corporate sustainability indicators (Wilson *et al.* 2006, p2). This can be linked to concerns that choosing sustainable development indicators at company level vary from specific circumstances such as strategies; objectives; infrastructure; viable data and other information relevant for making decisions (Krajnc and Glavic, 2005). In addition, companies vary in the amount of human and financial resources allocated towards achieving the aims of the process.

However, the criteria for choosing indicators explained below could be useful in this regard (Prescott-Allen, 2001).

### **6.9.1 Criteria for Choosing Sustainability Indicators**

Prescott-Allen's suggested criteria for choosing performance indicators in his publication *Wellbeing of Nations* could prove very user friendly for corporate level sustainability assessments because of the ease at which they can be adapted and expressed to a wide range of stakeholders.

The method is based on the notion that an indicator (or more) should be chosen for each issue or sub-issue only on the basis of how fully the indicator represents the issue concerned and how reliable and feasible it is (see Figure 7) (Prescott-Allen, 2001).



**Fig. 7.** Basis for choosing indicators. The ideal indicator is representative, reliable and feasible. Indicator selection is often a matter of balancing these qualities. Prescott-Allen (2001)

To be more explicit, Prescott-Allen (2001, p2-4) points out that for an indicator to be chosen as being fully *representative*, it has to cover the most important aspect of the issue or sub-issue concerned, and show trends over time and differences between places and groups of people.

Likewise, an indicator is expected to be *reliable* in order for it to be selected. In this regard an indicator is considered reliable if it is accurate; measured in a standardized way with sound and consistent sampling procedures; is well founded; and directly reflects the objective concerned (Prescott-Allen, 2001, p2-4). Well founded here is used in the sense that the relationship of the indicator to the issue or sub-issue it represents has to be well established and scientifically valid, or is a defensible and tested hypothesis (Prescott-Allen, 2001, p2-5). Indicators can only directly reflect the objective concerned, if it measures its actual achievement rather than those factors that advance or impede its achievement.

The *feasibility* of an indicator is the third and last but not the least requirement for choosing an indicator as noted by Prescott-Allen (2001, p2-5). In this respect, an indicator is considered feasible if it depends on data readily available or obtainable at reasonable cost to the company. This is important having in mind that most often than not data required for an assessment will be available in different forms and from diverse sources. For the sake of determining feasibility, the crucial distinction will be between (a) data that are already collected as a matter of course and are available as maps or as statistics; and (b) uncontrolled data (Prescott-Allen, 2001, p2-5).

An extra advantage here is that the criteria to organize potential indicators for each issue or sub-issue into different quality classes based on their representivity, reliability and feasibility (Prescott-Allen, 2001, p2-5). Where an indicator cannot be found for an issue, the issue concerned is eliminated from the assessment and the exclusion clearly noted (Prescott-Allen, 2001, p2-5).

Having chosen the indicators, it is necessary to then obtain the data for each of them. As noted by Prescott-Allen (2001), the assessment needs to set up its own data base; make arrangements with sources of existing data to receive them regularly; and organize surveys and monitoring systems for any indicator requiring data not currently collected. An example of such a system is presented in the background information section, which outlines the implementation of a Sustainability Management System (SMS).

## **6.10 Setup Performance Scale For Each Indicator**

A performance scale needs to be set up for each indicator so that the unit, in which the indicator was originally measured, can be converted to a performance rating on a barometer point scale (see Table 10).

**Table 10:** Example of a conceptual performance scale

<b>Sector Indicator scale</b>	<b>Point on Indicator Scale</b>	<b>Top point on Scale</b>	<b>Definition Indicator performance scale</b>
Good	81-100	100	Desirable performance, objective fully met
Ok	61-80	80	Acceptable performance or barely met
Medium	41-60	60	Neutral performance
Poor	21-40	40	Undesirable performance
Bad	1-20	20	Unacceptable performance
	0		Base of scale

Indicator measurements will be given values on the performance scale on the basis of the performance criteria used. Thus, in order to setup the performance scale, performance criteria are needed that show the standards of achievement for each indicator (Guijt and Moiseev, 2001).

In this step, participants need to choose performance criteria for each of the indicators that were selected in the previous step. The performance criteria chosen should be able to translate the objectives of the issues into measurable performance, and enable different indicator measurements to be converted to scores so that they can be combined (Prescott-Allen, 2001, p2-5).

Choosing performance criteria could be the most thought provoking part of an assessment of sustainable development because it requires making lots of judgments throughout (Prescott-Allen, 2001). It is also imperative to note here that, the choice of performance criteria is entirely up to the judgment of assessment participants.

### **6.11 Correspondence of Values on Indicator Scales to Points on the BOS Scale**

The Barometer of Sustainability has a 0-100 numbered scale, which consists of 100 points plus a base of zero. The scale is then divided into five sectors of 20 points each, plus the base of zero (see Table 11) (IUCN, 1997, p.9; Prescott-Allen, 2001, p.2-6).

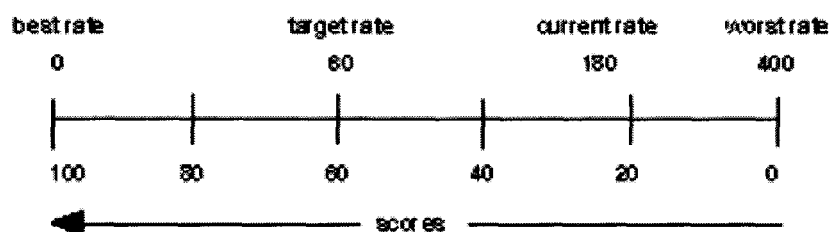
**Table 11.** Sectors of a Barometer of Sustainability Scale

Sector	Point on Scale
Good	81-100
Ok	61-80
Medium	41-60
Poor	21-40
Bad	1-20
Base	0

The five-sector scale provides users with an opportunity to control the entire scale by being able to define according to their needs, one or more of the sectors. That is, it allows users to be able to define not just the end points of the scale but the intermediate points of the scale as well, for greater flexibility and control of the scale (Prescott-Allen, 2001, p.5). It becomes easier to explain very precise and complicated information when the scale is divided this way (Ko, 2005, p439). For example, if a good income is considered to be R5, 000 or more and a bad income to be R1, 000 or less, the scale can be set accordingly.

This feature makes the BOS scale a powerful performance scale than if it were only the endpoints of the scale that were defined. Such a scale would alter or make results odd (IUCN, 1997, p.9; Prescott-Allen, 2001, p5). It is important to also note that the BOS scale can either be uncontrolled, partially controlled, or fully controlled depending on the users' needs.

In an uncontrolled scale, only the two end points (good and bad) are defined and the intervals between these two endpoints are equal (see Figure 8) (IUCN, 1997, p.16).



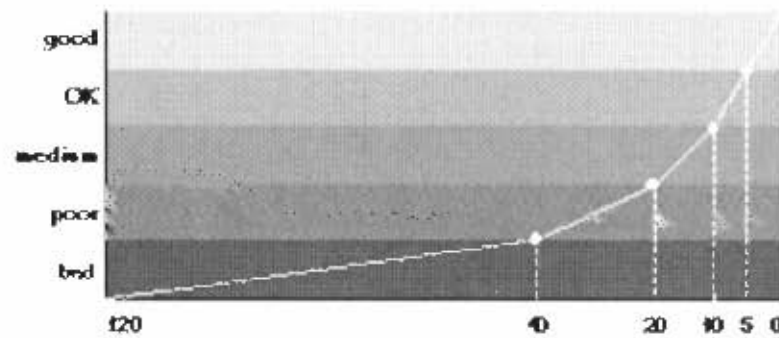
**Fig.8.** Conceptual example of an uncontrolled scale (Diagram source: IUCN 1997)

In an uncontrolled scale, the sector (good, ok, medium, poor or bad) an indicator reading falls in is determined by the end points of the scale, and not by whether the level of performance that would fall into a particular sector is appropriate for that sector (IUCN, 1997, p.16). This feature of an uncontrolled scale should always be taken into consideration in order to ensure that the results are defensible (IUCN, 1997, p.16).

Also note that when dealing with an uncontrolled scale, sometimes the sectors (good, ok, medium, poor or bad) are equal but more often they are not (IUCN, 1997, p.17). However, its most important sectors are “good” and “ok” because they define good conditions for sustainability. In addition, because good performance could mean desirable or ideal or even both, the good sector therefore must be clearly defined (IUCN, 1997, p.17).

Still with the uncontrolled scale, the “ok” performance may be thought of to mean acceptable, or better than acceptable performance (IUCN, 1997, p.17). *“The boundary between good and ok may be thought of as the gateway to wellbeing; and the boundary between ok and medium as the gateway to the neighbourhood of wellbeing”*, (IUCN, 1997, p.17). For these reasons “ok” performance should be clearly defined towards the direction of good performance (IUCN, 1997, p.17).

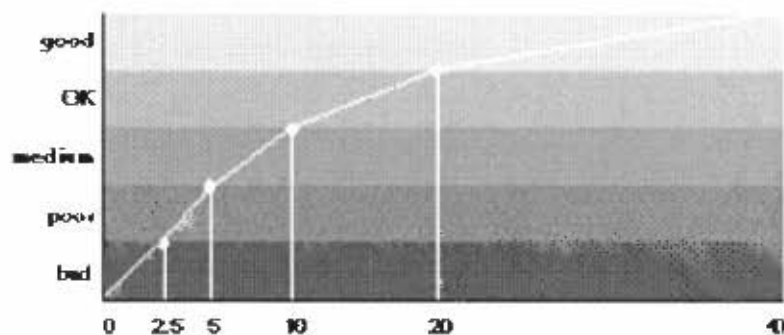
When it is not appropriate to use an uncontrolled scale, a partially or fully controlled scale should be used. Note that when the scale is either partially or fully controlled, the scale ceases to be one scale with equal intervals throughout, but instead becomes a set from two to five scales depending on the number of sectors defined (IUCN, 1997, p.18). In a partially controlled scale, either the good sector or bad sector (or sometimes both) is defined while in a fully controlled scale all the sectors are defined (see Figure 8) (IUCN, 1997, p.17-18, p.23).



**Fig.9.** Conceptual example of a fully controlled scale (all sectors are defined). (Diagram source: IUCN 1997)

*"In a partially or fully controlled scale, the good or ok sectors may include a narrower or a wider range of performance than the other sectors. A narrower range of performance occurs in indicators where the good (and sometimes ok) sector represents a high standard: the better the performance, the more difficult it is to make improvements" (IUCN, 1997, p.18).*

Choosing a partially or fully controlled scale involves making two important decisions: first, decide on the most convenient way of ensuring that the scores falling in the good or ok sectors are indeed good or ok. Secondly, consider whether it is desirable to define the bad and poor sectors as carefully as done with the good and ok sectors (see Figure 9) (IUCN, 1997, p.19).



**Fig.10.** Another conceptual example of a fully controlled scale. (Diagram source: IUCN 1997)

The main ideology behind this step is that converting indicators scores to the BOS scale maintains a process of clearly defining what we mean by progress in sustainability. That is,

people need to state explicitly their assumptions about the significance of the indicator in the context in which it is being used, and the levels of achievement that will be ideal, desirable, acceptable or disastrous (IUCN, 1997, p.10). To do otherwise will be to allow the scale to make the decisions by applying a formula (as will be explained below) rather than struggle to think things out.

It would be possible to control the scale without dividing it up into sectors by applying a formula that would calculate the distribution of indicator score on the barometer scale (IUCN, 1997, p.10; Prescott-Allen, 2001, p2-8, Guijt and Moiseev, 2001). But sectors labeled “good”, “ok”, “medium”, “poor” and “bad” (shown in the first half of this step) are preferable to a formula for two reasons. Firstly, they are easier to understand and more open to scrutiny and secondly, they make it obvious that judgments are being made and are kept transparent (IUCN, 1997, p.10).

The indicator measurement’s exact position on the BOS scale can be calculated in one of two ways (IUCN, 1997, p.22; Prescott-Allen, 2001, p2-8, Guijt and Moiseev, 2001) depending on whether:

- Best performance is the highest value and worst performance is the lower value on the indicator scale. For example BEE transformation.

Or:

- Best performance is the lowest value and worst performance is the highest value on the performance scale. For example air pollution levels.

When best is the highest value and worst the lowest value on the indicator performance scale, the formula to be used for converting the indicator value to a point on the BOS scale is as indicated using the conceptual example below (see Table 12, Figure 11, Box 1 and Box 2).

For example, assume that the actual performance value of an indicator is 17%. Based on the performance criteria given in Table 12, the indicator value will fall into the Ok band because it is between 20% and 10% on the indicator scale. With 20% corresponding to 80 on the BOS scale (the top point of the Ok sector); and 10% on the indicator scale corresponds to 60 on the BOS scale (base point on the Ok sector) (see Figure 11).

people need to state explicitly their assumptions about the significance of the indicator in the context in which it is being used, and the levels of achievement that will be ideal, desirable, acceptable or disastrous (IUCN, 1997, p.10). To do otherwise will be to allow the scale to make the decisions by applying a formula (as will be explained below) rather than struggle to think things out.

It would be possible to control the scale without dividing it up into sectors by applying a formula that would calculate the distribution of indicator score on the barometer scale (IUCN, 1997, p.10; Prescott-Allen, 2001, p2-8, Guijt and Moiseev, 2001). But sectors labeled “good”, “ok”, “medium”, “poor” and “bad” (shown in the first half of this step) are preferable to a formula for two reasons. Firstly, they are easier to understand and more open to scrutiny and secondly, they make it obvious that judgments are being made and are kept transparent (IUCN, 1997, p.10).

The indicator measurement’s exact position on the BOS scale can be calculated in one of two ways (IUCN, 1997, p.22; Prescott-Allen, 2001, p2-8, Guijt and Moiseev, 2001) depending on whether:

- Best performance is the highest value and worst performance is the lower value on the indicator scale. For example BEE transformation.

Or:

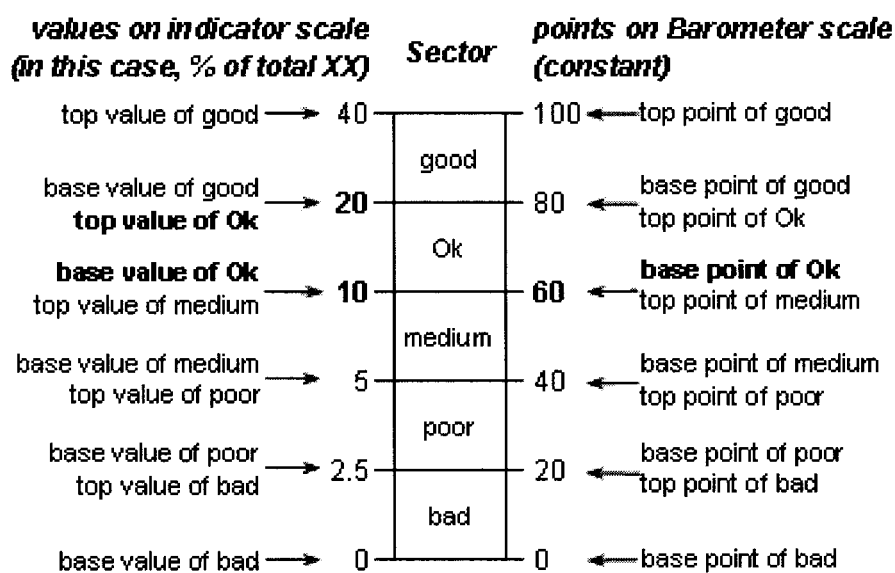
- Best performance is the lowest value and worst performance is the highest value on the performance scale. For example air pollution levels.

When best is the highest value and worst the lowest value on the indicator performance scale, the formula to be used for converting the indicator value to a point on the BOS scale is as indicated using the conceptual example below (see Table 12, Figure 11, Box 1 and Box 2).

For example, assume that the actual performance value of an indicator is 17%. Based on the performance criteria given in Table 12, the indicator value will fall into the Ok band because it is between 20% and 10% on the indicator scale. With 20% corresponding to 80 on the BOS scale (the top point of the Ok sector); and 10% on the indicator scale corresponds to 60 on the BOS scale (base point on the Ok sector) (see Figure 11).

**Table 12** Performance criteria for a conceptual indicator (table adapted from Prescott-Allen, 2001)

Sector	BOS scale showing Top point on the scale	Indicator scale showing Performance Criteria in %
Good	100	40
Ok	80	20
Medium	60	10
Poor	40	5
Bad	20	2.5
Base	0	0



**Fig.11** Correspondence of Values on an indicator Scale when best performance is the highest value and worst the lowest. Sourced and adapted from: Prescott-Allen (2001)

The Values on the Indicator Scale on the left – 40,20,10,5,2.5,0 – are indicator specific. In this instance they define the performance sectors for a conceptual indicator as a % of the total performance of the indicator. The points on the Barometer scale on the right – 100,80,60,40,20 – define the sectors of the barometer. They remain constant. See text and formulae for explanation of how the values and points highlighted in bold are selected and used to calculate the score for the corporate indicator concerned.

**[(Actual indicator value) minus (minimum indicator value) divided by (Maximum indicator value) minus (minimum indicator value)] multiplied by 20, then add to (the minimum value of the sector concerned on the barometer scale) = Exact point of the indicator on the BOS scale**

**Box.1.** Formula for calculating indicator score on the BOS scale when top value on indicator scale is best performance and base value is worst performance.

**17(Actual indicator value) - 10(minimum indicator value) = 7 20(Maximum indicator value) - 10(minimum indicator value) = 10**

**7 ÷ 10 = 0.7**

**0.7 X 20 = 14**

**14 + 60 (Base point on BOS scale) = 74 (Exact point on BOS scale).**

**Box.2.** Demonstrated calculation of indicator score on the BOS scale when top value on indicator scale is best performance and base value is worst performance.

Note that the terms highest (or top or maximum) and lowest (or base or minimum) always refers to the sector (band) in which the indicator measurement falls, while the actual indicator value is the measurement of the indicator on the indicator scale being scored (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001). The maximum (or top or highest) indicator value is the top value of the relevant sector on the indicator scale; and the minimum (or base, lowest) indicator value is the base value of the sector (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001). Also, the base point of the sector is the base point of the relevant sector on the barometer scale (see Figure 10) (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001).

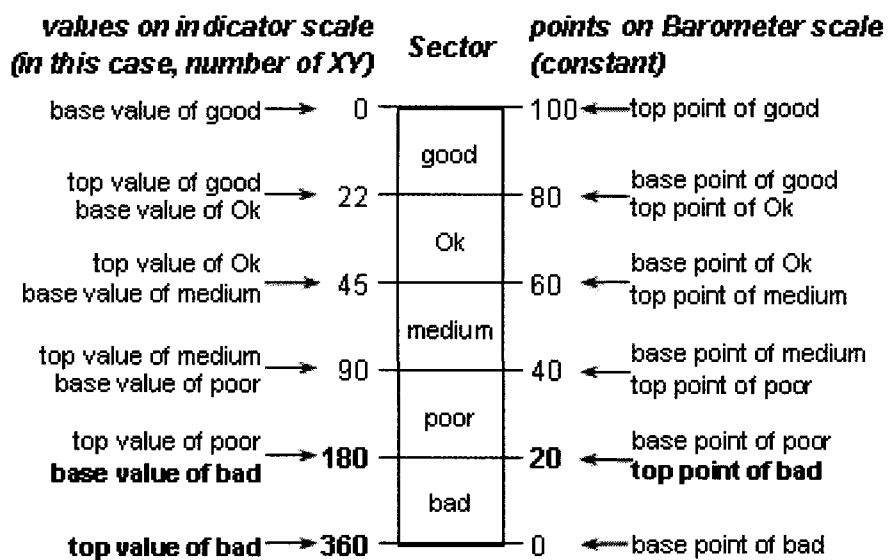
However, when best is the minimum value and worst the maximum value on the indicator performance scale, the formula to be used for converting the indicator value to a point on the BOS scale is as indicated using another conceptual example below.

For example, assume that the actual performance value of another indicator is 200. Based on the performance criteria given in Table 12, the indicator value will fall into the bad sector because it is between 180 and 360 on the indicator scale. With 180 of the indicator scale corresponding to 20 on the BOS scale (the top point of the bad sector); and 360 on

the indicator scale corresponds to 0 on the BOS scale (base point on the bad sector) (see Table 13, Figure 12, Box 3 and Box 5).

**Table 13.** Performance criteria for a conceptual indicator

<i>Sector</i>	<i>BOS scale showing Top point on the scale</i>	<i>Indicator scale showing Performance Criteria</i>
Good	100	0
Ok	80	22
Medium	60	45
Poor	40	90
Bad	20	180
Base	0	360



**Fig.12.** Correspondence of Values on an indicator scale to points on the Barometer Scale when best performance is the lowest value and worst the highest.

The values on the indicator scale on the left – 0,22,45,90,180,360 – are indicator specific. In this instance they define the performance sectors for a conceptual indicator based on its total performance. The points on the Barometer scale on the right – 100,80,60,40,20,0 – define the sectors of the Barometer. They remain constant. Note that the base point of each band is still the top point of the band below. However, the base value now

corresponds to the top point of the sector, the top value, to the base point. See text and formula for an explanation of how the values and points highlighted in bold are selected and used to calculate the score for the corporate indicator concerned. Sourced and adapted from: Prescott-Allen (2001)

**[(Actual indicator value) minus (minimum indicator value) divided by (Maximum indicator value) minus (minimum indicator value)] multiplied by 20, then subtract (from the top value of the sector concerned on the barometer scale) = Exact point of the indicator on the BOS scale**

**Box.3.** Formula for calculating indicator score on the BOS scale when base value on indicator scale is best performance and top value is worst performance.

**200 (Actual indicator value) – 180 (minimum indicator value) = 20**  
**360 (Maximum indicator value) – 180 (minimum indicator value) = 180**  
**20 ÷ 180 = .111**  
**0.111 X 20 = 2.22**  
**20(top value of sector concerned on barometer scale) – 2.22 = 17.78 = Exact point of the indicator on the BOS scale.**

**Box.4.** Demonstrated calculation of indicator score on the BOS scale when base value on indicator scale is best performance and top value is worst performance.

As before, note that the terms highest (or top or maximum) and lowest (or base or minimum) always refers to the sector (band) in which the indicator measurement falls, while the actual indicator value is the measurement of the indicator being scored (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001). Also, the maximum (or top or highest) indicator value is the top value of the relevant sector on the indicator scale; and the minimum (or base, lowest) indicator value is the base value of the sector (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001). The difference between this and the previous calculation is that the indicator scale moves in the opposite direction to the BOS scale – from lowest to highest instead from highest to lowest (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001). In that case, the top value of a band on the indicator scale corresponds to the lowest point of the band on the BOS scale; and the lowest value of the sector on the indicator scale corresponds to the top of the sector on the barometer scale (see Figure 11) (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001). Another

difference is that the final step in the calculation is to subtract from the top point of the sector on the BOS scale, rather than adding to its base point (IUCN, 1997; Prescott-Allen, 2001; Guijt and Moiseev, 2001).

It may have been noticed by now that the formulae used above have been in situations where the BOS scale is made of five sectors with equal parts (whole scale).

When the BOS scale is uncontrolled, partially controlled or fully controlled (i.e. the BOS scale not equally segmented), each sector or group of sectors is calculated separately. But the calculation method stays the same (as for the scale as a whole) as applied in both examples earlier. The only difference is that the multiplier is no longer twenty because the value of the difference between the maximum value and the minimum value of the sector concerned on the BOS scale changes to a new value; and the final score is also added to the base value of the band on the BOS scale.

It is important to note when doing calculations with an uncontrolled, partially controlled or fully controlled scale that a reading that equals any of the end points is simply given the corresponding score on the BOS scale (IUCN, 1997, p.23). For example, if an indicator performance value on the indicator scale is 46 it would automatically be given a score of 21 on the BOS scale (See Table 14).

**Table 14.** The logic of the example is also demonstrated through the use of a formula (see Box 1 and Box 5).

Sector	Point on BOS scale	Indicator performance criteria
Good	21 – 100	46 – 84
Bad	1 – 20	26 – 45
Worst	0	25

$46(\text{Actual indicator value}) - 46(\text{minimum indicator value}) = 0$ $84(\text{Maximum indicator value}) - 46(\text{minimum indicator value}) = 38$ $0 \div 38 = 0$ $0 \times 80 = 0$ $0 + 21 \text{ (base point on BOS scale)} = 21 \text{ (Exact point of the indicator on the BOS scale)}$
---

**Box .5.** A formula to demonstrate that a reading that equals any of the end points on the indicator scale is given the corresponding score on the BOS scale.

In all cases when doing calculations, scores are rounded up to the nearest number e.g. 0.5 may be rounded up or down - *“usually, it is rounded conservatively - which ever produces the lower score”* (IUCN, 1997, p.24).

It is important to remember that when calculating scores within a sector (or within a group of sectors), the maximum is the top of the sector (or band) concerned but the minimum is the base of the sector below. This is because the minimum always corresponds to the zero position at the base of the scale as indicated earlier (IUCN, 1997, p.24). This is required for a situation where the maximum value (100) of the scale represents the “Good”, and the minimum value (0) of the scale represents “Bad” see Table 16.

**Table 15.** Corresponding performance description with minimum and maximum scores

<b>Sector</b>	<b>Point on Scale</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Base</b>
Good	81-100	100	80	80
Ok	61-80	80	60	60
Medium	41-60	60	40	40
Poor	21-40	40	20	20
Bad	1-20	20	0	0

Inversely, when the minimum value represents best and the maximum value refers to worst, the maxima, minima, and bases (zero) will correspond as shown in Table 16 below (IUCN, 1997, p.25).

**Table 16.** Table showing correspondence between minimum, maximum and base value.

<b>Sector</b>	<b>Point on Scale</b>	<b>Maximum</b>	<b>Minimum</b>	<b>Base</b>
Good	81-100	80	100	80
Ok	61-80	60	80	60
Medium	41-60	40	60	40
Poor	21-40	20	40	20
Bad	1-20	0	20	0

## 6.12 Combining Indicator Scores

With the Barometer of sustainability, indicator scores are combined up the hierarchy from the lowest to the highest category. For example if the categories are

- i. System
- ii. Subsystem
- iii. Dimension
- iv. Issue
- v. Sub-issue
- vi. Indicator

Then the sequence of calculation will be from indicator to sub-issue, from sub-issue to issue, from issue to dimension, and from dimension to subsystem (IUCN, 1997, p.28). In the case of the proposed framework of this dissertation, the dimension level values may provide sufficient information for the communication of overall sustainability of corporate sustainability.

When a single indicator represents an issue, the indicator's score automatically becomes the score of the issue. While if two or more indicators represent an issue, the scores of the indicators should be aggregated in order to get a score for the issue (IUCN, 1997, p.28).

The following standard procedures for aggregating indicators can be applied in this step. (IUCN, 1997, pp.28-29):

- If users consider the indicators to be equally important, then the indicators are added together and then the average taken;

- If some of the indicators are regarded as being more important than others, then they need to be weighted according to their relative importance before they are added and averaged; or
- If one indicator is regarded to be critical, it can be given a veto function, over the other indicators.

Also, if a single issue represents a dimension, the issue's score automatically is the dimension score. But if two or more issues represent a dimension, then the issues must be aggregated following the same procedure as for indicators so as to get the score of the dimension (IUCN, 1997, p.29).

### 6.13 Develop Corporate Sustainability Assessment Maps

This step is focused on presenting the outputs from the assessment exercise in graph form. Presenting the results in this fashion serves the following purposes: It helps to identify the current situation in the company; helps to generate possible future scenarios from the current situation; helps to clarify tradeoffs that may be implicit in indicator selection; helps to make issues and concerns more accessible to stakeholders, helps to assist decision-makers (stakeholders) to define their goals and objectives; assist in making all parts of the sustainability assessment process clear and explicit; and to serve as an educational tool (Clayton and Radcliffe, 1996, p195; Ko, 2005, p195).

It is at this step that the major theoretical adaptation has been made to the original barometer of sustainability for it to be useful at the corporate level. As noted by Ko, (2005), the Barometer of Sustainability is useful at explaining the comprehensive level of sustainability of the human subsystem and ecosystem subsystem, but on the other hand, it fails to demonstrate the sustainability of individualized indicators.

In this dissertation, three graphical models have replaced the two axis graphical representation which are: 1) Indicator level corporate sustainability radar (for illustrating the levels of sustainability of individual indicators within one particular dimension); 2) Detailed dimension corporate sustainability radar (for illustrating indicator values for all four dimensions); and 3) Corporate sustainability diamond (for illustrating the overall

aggregated level of sustainability of the economic, social, institutional and environmental dimensions). As already mentioned the BOS scale could also be used to illustrate sustainability on a two-component axis, at the human and ecosystem level if need be.

## 6.14 Review Results and Propose Policies

According to Prescott-Allen, 2001. The review step is very important because it connects the assessment to action by:

- Analyzing the indicator, and the patterns of performance and the data behind them.
- Determining the issues and areas where improvements are most needed.
- Proposing policies and actions to make the improvements.
- Planning the priority actions.
- Reviewing and revising policy, program and project objectives and targets.

The review step should help in revealing the dimensions that most need improvement and if required, further analysis could be done to identify the issues and sub-issues requiring priority attention; causes of the main problems; and what policy actions are needed in response (Prescott-Allen, 2001).

## 6.15 Extend Sustainability Assessment Over Time

This step is important because, relying on results from a single assessment is not sufficient to arrive at a conclusion with regards to sustainability (Ko, 2005). Thus, determining sustainability will require a sequential assessment process over a period of time (e.g. for 3 or 5 or 10yrs) (Ko, 2005).

In practice, data collection in the assessment process should be effective and consistent (Ko, 2005). Participants should ensure that relevant information is compiled periodically for ongoing monitoring of progress towards (or away from) sustainability, and changing stakeholder perceptions (Ko, 2005). The radars included in Chapter 8 may be modified to allow users to represent sustainability over a number of years.

## 6.15 Caution about the Barometer of Sustainability

It is advisable for users to keep in mind that, the barometer readings are merely a means to an end, and not the end itself (IUCN, 1997, p.29). Consequently, the barometer results need to be accompanied by an analysis of the key issues that together will enable its users/decision makers to draw concrete conclusions about the condition of sustainability; as well as priorities for action (IUCN, 1997, p. 29).

It is also important to have in mind that a sustainability assessment involves making value judgments, from the model of the system and the goal, through to making decisions about aggregation, and to the interpretation of indicators (IUCN, 1997, p. 29). The values and judgments must be made very clear, so that anyone who disagrees with them can see how alternative judgments would alter the assessment (IUCN, 1997, p. 29). That is every part of the assessment needs to be presented in a way that allows interested parties to use different indicators or alternative arrangements (IUCN, 1997, p. 29). Interested parties should also be made aware of what data support the indicators, the confidence in the data, and the interpretations and judgments involved in choosing, calculating and combining the indicators (IUCN, 1997, p. 29).

It is also important to note that the primary purpose of the Barometer of Sustainability is not to check whether a company is performing better compared to others; but rather whether the company is doing well in terms of its own criteria (IUCN, 1997, p.10). Because, when it comes to sustainability, being seen as one of the top 10 best companies is small comfort if everyone is doing terribly (IUCN, 1997, p.10). This fact is supported by a number of experts in the discipline who teach that an approach in sustainability assessment should strive to bring sustainability closer to becoming an operational guide for designing a better future (Khosla, 1995, p9; Ko, 2005, p435). This is also supported by Munro (1995) with the idea that the key is to develop a protocol for assessing sustainability and to follow it consistently to ensure a comprehensive, careful, and deliberate decision making process (Ko; 2005). Therefore, companies should use the BOS tool to track where they see themselves and where they want to be in terms of achieving sustainability (IUCN, 1997, p.10, p.30). Nevertheless, this does not cancel the fact that the BOS is a good measuring tool that can be used to compare and rank companies in terms of progress towards sustainable development (IUCN, 1997; Prescott-Allen, 2001).

The following chapter provides a brief summary of the methodological adaptations that have been made to the Barometer Framework in order to accommodate the corporate context.

# Chapter 7

## 7. Methodological Adaptations

### 7.1 Introduction

This short chapter provides a brief summary of the methodological adaptations that have been made to the Barometer in order to adapt it for use in a corporate context.

### 7.2 Theory of the Adaptive Process

This section provides theoretical justification and a graphic representation of our methodological procedure that for creating a new corporate sustainability assessment framework for a CSDI.

From the research group's experience of theoretical frameworks for the assessment of sustainability, it may be said to comprise of:

- a) Particular definitions and conceptualisations of core orientating concepts, (e.g. system, subsystem).
- b) Methodologies for assessing or measuring concepts and variables, which are based on epistemological assertions about how it is possible to enact change in things in the world (e.g. the three-pillared approach).

A theory of method may be said to proceed from a theory of knowledge, and that these two key elements of a framework must be integrated in order for the framework to be plausible. However, it is possible to select a concept or concepts from one framework and integrate it/them with concepts or methodologies from other frameworks. It is also possible to take elements from one methodological framework and integrate them with elements from other methodological frameworks. This dissertation engages in the design of theory, where design means to create and evaluate forms in an iterative process of analysis of components and synthesis into patterns or organising structures (Lawrence, 1997, citing

Alexander, 1964). “*Analysis articulates, clarifies, and creates a structure of meaningful distinctions*”, while “*synthesis binds, blends, and embraces distinctions drawn through analysis*” (Lawrence, 1997: p. 84, citing Douglas, 1972).

This process is indeed how many frameworks have come into existence (Reed *et al.* (2006), Brown *et al.* (2005), Krajnc and Glavic (2005). New theories of method select and combine elements from other theories of method.

The key concerns here are compatibility and functionality. If frameworks are comprised of the following 3 key levels; fundamental concepts, fundamental relationships between elements in the world, and specific organizational structures, where one level is only functional by virtue of its dependence on the other two levels, then it needs to be transplanted and integrated in a three level form. This must be done in a way that does not conflict with any other concept, methodological principle or method in a new adapted framework. Further, concepts, methodologies and organizational structures may be transplanted in a one level form if they are adaptable to the two other levels, which may have come from other frameworks.

It was with this kind of thinking that the research group approached the adaptation of the Barometer for the Scope of work of this dissertation.

The usefulness of a theoretical model lies in its ability to assist in the selection of indicators and to highlight indicators, which do not reflect current priorities but may emerge in the future (Shippey 2001). Hardi *et al.* (1997) comment that an effective framework serves as a template to be revisited from time to time as a test of current priorities. The combination of aspects from different models was done in order to produce a richer base model for indicator selection that was relevant to the corporate context.

### 7.3 Key Adaptations of the Barometer

The key reasons for using aspects of the Barometer framework were as follows:

- It is a logical and practical approach to compartmentalising sustainability issues for their identification and management.

- It is easily adapted from the common triple bottom line approach, which is currently used in many corporate organisations for reporting purposes.
- It is mechanism that encourages strategic decision-making and informs managers and decision makers about areas of the company that are performing well or are under-performing with respect to sustainability.
- It is a tool that has the ability to allow for adaptive management.

A CSDI framework needs to have the ability to effectively collect, analyse and report back sustainability information in a practical and efficient manner to allow changes to be made and fed back into the management system. Such a strategic tool is underpinned by the concept of adaptive management. This concept emphasises the “systematic acquisition and application of reliable information to improve management over time” (Lee, 1999). Ruitenbeek and Cartier (2001) define it as a long-term management structure that permits stakeholders to share management responsibility and learn from their actions. Together these definitions incorporate the most important aspects of adaptive management and include the obvious objective of improving management practice, sharing information amongst all affected parties and, most significantly, learning through experiences and acquiring knowledge that will help in implementing future procedures and objectives.

The Barometer views sustainability as a combination of human well-being and ecosystem well-being (IUCN, 1997, p.8). It uses these two fundamental subsystems to link all other aspects of sustainability together to present them in one final graphical output. This method of measuring sustainability enables all human issues to be weighted equally with environmental issues and therefore falls within the ambit of strong sustainability. These dimensions are important end points when evaluating the sustainability of large complex entities such as nations but do not necessarily speak practically and effectively at the organizational level. One might find human and ecosystem well-being applicable end points to an industry wide level but through the practical experience of implementing an SMS, it was evident that a more detailed end point is required for effective feedback into the organisation.

### **7.3.1 Summary of Adaptations to the Barometer**

- Focus on the dimension level of sustainability instead of a two-component sub-system level.
- Graphical Representation altered to reflect change in focus of conceptual basis from a two-axis output to a four-axis output.

## **7.4 Key Methodological Advancements for Sustainability Assessment within a Corporate Retail Entity**

- Procedures for users to create a Sustainability Management System (SMS) based on adaptive management.
- Development of a four-pillared conceptual framework for the assessment of sustainability within a corporate entity.
- Inclusion of methodology for a Composite Sustainable Development Indicator
- Development of radar charts and sustainability diamond for reporting of sustainability information to inform different levels of decision-making.

The following chapter provides an illustrative example of how the proposed framework should work. It includes the application of the methods explained in Chapter 6.

# Chapter 8

## 8. Illustrative Example

### 8.1 Introduction

This section has been included in order to provide an illustration of how the proposed Composite Sustainable Development Indicator Framework (CSDI) works. The examples provided below are not intended to be exhaustive but aim to briefly illustrate how the CSDI could be applied within the framework of a Sustainability Management System (SMS) and how sustainability information can be presented in a practical and usable format. This dissertation proposes the use of simple graphical outputs to map a company's sustainability performance with respect to the four-pillars of sustainability. As mentioned previously, a CSDI is a tool used to organize and display sustainability information for effective feedback into the organization so that a company can communicate its sustainability goals, objectives and performance in an efficient and effective manner. The three maps provided constitute a further adaptation of the Barometer's two axis graphical representation.

### 8.2 Illustration Assumptions

This illustration assumes that a company has already:

- Set up an SMS to manage and store sustainability information
- Decided on the various indicators required for each of the four-pillars of sustainability
- Have reliable quantitative information on each indicator
- Have set up a weighting scale for each indicator and tier within the Barometer's hierarchy for the summation of performance scores.

## 8.3 The Calculation Process

### 8.3.1 Setting the Performance Scale

As explained earlier, the Barometer has a 0-100 scale, which is divided into five sectors (e.g. Good, Ok, Medium, Poor Bad). The user needs to define the indicator measurement range for each sector and set the scale for each indicator. One of the suggested methods is to select the end points as the best and worst, to encompass the range of performance that has been experienced in the past and could be experienced in the foreseeable future. The scoring process will be explained by calculating performance scores for two separate sub issues within the social dimension of sustainability, namely 'Gender Equity' and 'Consumer Privacy (indicated in blue in Figure 13), both of which form part of the Social Dimension.

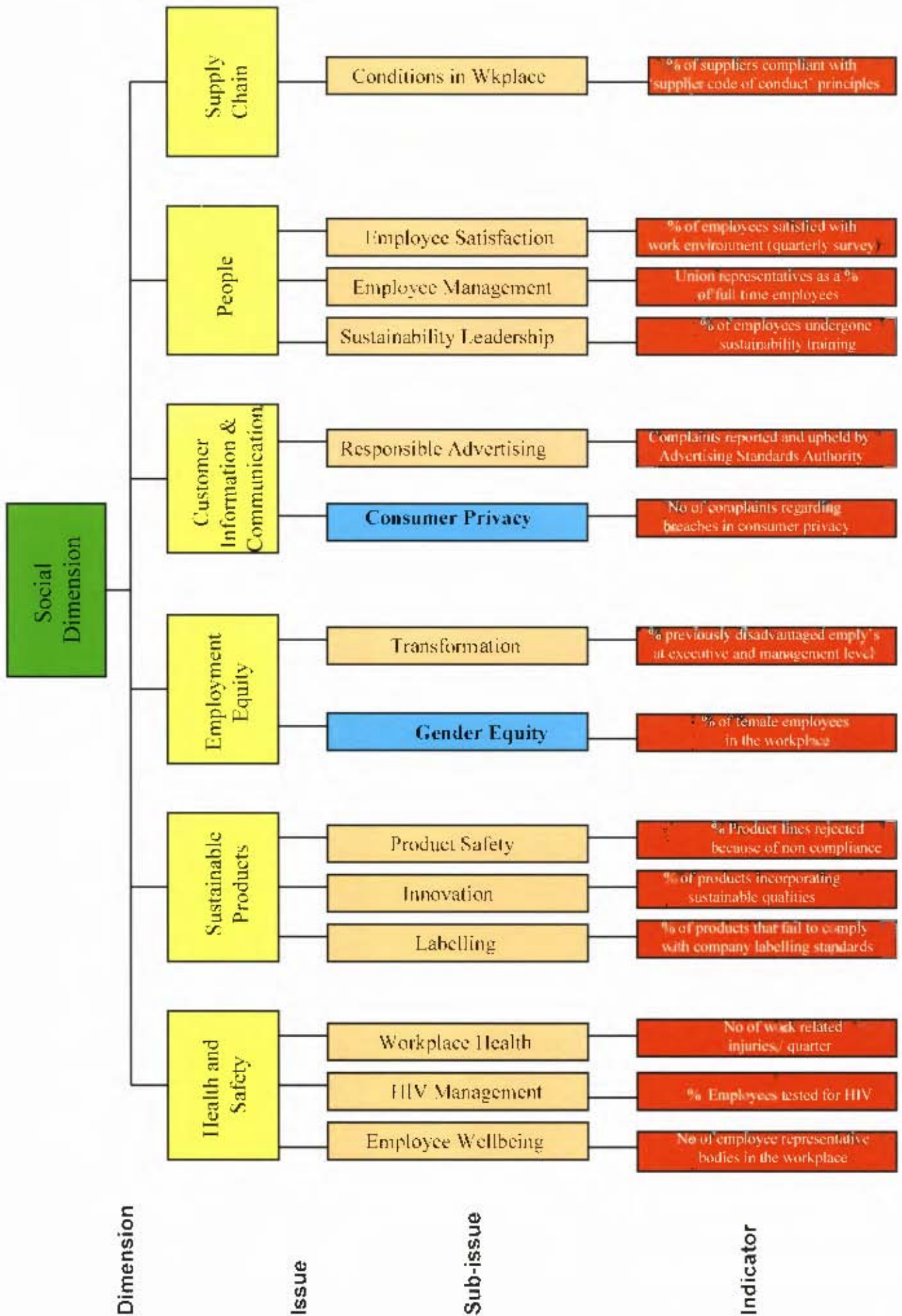


Fig.13. Hierarchical tier of the Social Dimension

### 8.3.2 Gender Equity

The following example is based on a company's hypothetical objective of increasing the number of females within its workforce. If, for example, the measured value for the indicator gender equity is 45% females, based on the performance criteria given in Table 17, the indicator value will fall into the Ok sector. Thus, 30% on the indicator scale corresponds to 60 points on the BOS scale (the minimum points of the ok sector); and 50% on the indicator scale corresponds to 80 on the BOS scale (maximum point of the ok sector).

**Table 17.** Performance criteria for Gender Equity

Sector	Point on BOS Scale	Maximum on BOS Scale	Minimum on BOS Scale	Indicator scale showing Performance Criteria in % of females
Good	81-100	100	80	51 – 60
Ok	61-80	80	60	30 – 50
Medium	41-60	60	40	21 – 29
Poor	21-40	40	20	11 – 20
Bad	1-20 0	20	0	1 – 10

The actual measured value and the performance scale are then used to calculate a single figure for gender equity between 0 and 100. This number represents the level of sustainability for each particular indicator (see calculation below).

$$\frac{[(\text{Actual indicator value}) - (\text{minimum indicator value}) / (\text{Maximum indicator value}) - (\text{minimum indicator value})] * (\text{the difference of the max. and min. value of the barometer sector concerned}), \text{ then add (to the minimum value of the sector concerned on the barometer scale)} = \text{Exact point of indicator on the BOS scale}$$

**Box.1.** Formula for calculating indicator score on the BOS scale when top value on indicator scale is best performance and base value is worst performance.

### 8.3.2 Gender Equity

The following example is based on a company's hypothetical objective of increasing the number of females within its workforce. If, for example, the measured value for the indicator gender equity is 45% females, based on the performance criteria given in Table 17, the indicator value will fall into the Ok sector. Thus, 30% on the indicator scale corresponds to 60 points on the BOS scale (the minimum points of the ok sector); and 50% on the indicator scale corresponds to 80 on the BOS scale (maximum point of the ok sector).

**Table 17.** Performance criteria for Gender Equity

Sector	Point on BOS Scale	Maximum on BOS Scale	Minimum on BOS Scale	<i>Indicator scale showing Performance Criteria in % of females</i>
Good	81-100	100	80	51 – 60
Ok	61-80	80	60	30 – 50
Medium	41-60	60	40	21 – 29
Poor	21-40	40	20	11 – 20
Bad	1-20	20	0	1 – 10
	0			

The actual measured value and the performance scale are then used to calculate a single figure for gender equity between 0 and 100. This number represents the level of sustainability for each particular indicator (see calculation below).

$$\frac{[(\text{Actual indicator value}) - (\text{minimum indicator value}) / (\text{Maximum indicator value}) - (\text{minimum indicator value})] * (\text{the difference of the max. and min. value of the barometer sector concerned}), \text{ then add (to the minimum value of the sector concerned on the barometer scale)} = \text{Exact point of indicator on the BOS scale}$$

**Box.1.** Formula for calculating indicator score on the BOS scale when top value on indicator scale is best performance and base value is worst performance.

$$\begin{aligned}
 &45(\text{Actual indicator value}) - 30(\text{minimum indicator value}) = 15 \\
 &50(\text{Maximum indicator value}) - 30(\text{minimum indicator value}) = 20 \\
 &15 \div 20 = 0.75 \\
 &0.75 \times 20 = 15 \\
 &15 + 60 = 75 \text{ (Exact point of 'Gender Equity'-female indicator on the BOS scale)}
 \end{aligned}$$

**Box.6.** Demonstrated Calculation of indicator score on the BOS scale when top value on indicator scale is best performance and base value is worst performance

### 8.3.3 Consumer Privacy

If the actual performance value for the indicator, consumer privacy, is 69 consumer complaints, based on the performance criteria given in table 19, the indicator value will fall into the poor sector. 41 complaints on the indicator scale corresponds to 20 on the BOS scale (the minimum point of the poor sector) and 70 on the indicator scale corresponds to 40 on the BOS scale (maximum point of the poor sector).

**Table 18.** Performance criteria for Consumer Privacy

Sector	Point on BOS Scale	Indicator scale showing consumer privacy in no of complaints
Good	81-100	0 – 10
Ok	61-80	11 – 20
Medium	41-60	21 – 40
Poor	21-40	41 – 70
Bad	1-20	71 – 200
	0	

$$\frac{\{(\text{Actual indicator value}) - (\text{minimum indicator value})\}}{(\text{Maximum indicator value}) - (\text{minimum indicator value})} \times (\text{the difference of the max. and min. value of the barometer sector concerned}), \text{ then subtract (from the top value of the sector concerned on the barometer scale)} = \text{Exact point of indicator on the BOS scale}$$

**Box.3.** Formula for calculating indicator score on the BOS scale when minimum value on indicator scale is best performance and maximum value is worst performance.

The calculation will be as follows:

$$\begin{aligned} 69(\text{Actual indicator value}) - 41(\text{minimum indicator value}) &= 28 \\ 70(\text{Maximum indicator value}) - 41(\text{minimum indicator value}) &= 29 \\ 28 \div 29 &= 0.9655 \\ 0.9655 \times 20 &= 19.31 \\ 40(\text{top point on BOS sector concerned}) - 19.3 &= 20.7 \approx 21 \text{ (Exact point of the} \\ &\text{'Consumer Privacy' indicator on the BOS scale)} \end{aligned}$$

**Box 7.** Demonstrated Calculation of indicator score on the BOS scale when base value on indicator scale is best performance and top value is worst performance.

The above two examples show how each indicator is converted to a single figure between 1 and 100. This process is performed for each indicator on the Barometer hierarchy. This conversion to a single scale allows the sustainability scores of each indicator to be combined into single scores further up the Barometer's hierarchy (See Figure 14). The final score for the social dimension is represented by a single figure at the top of the Barometer hierarchy.

Different weightings can be given to each indicator, sub issue and issue, depending on its perceived level of significance, as mentioned in Chapter 6. This illustration has assumed equal weightings for all levels of the Barometer hierarchy (See Figure 14).

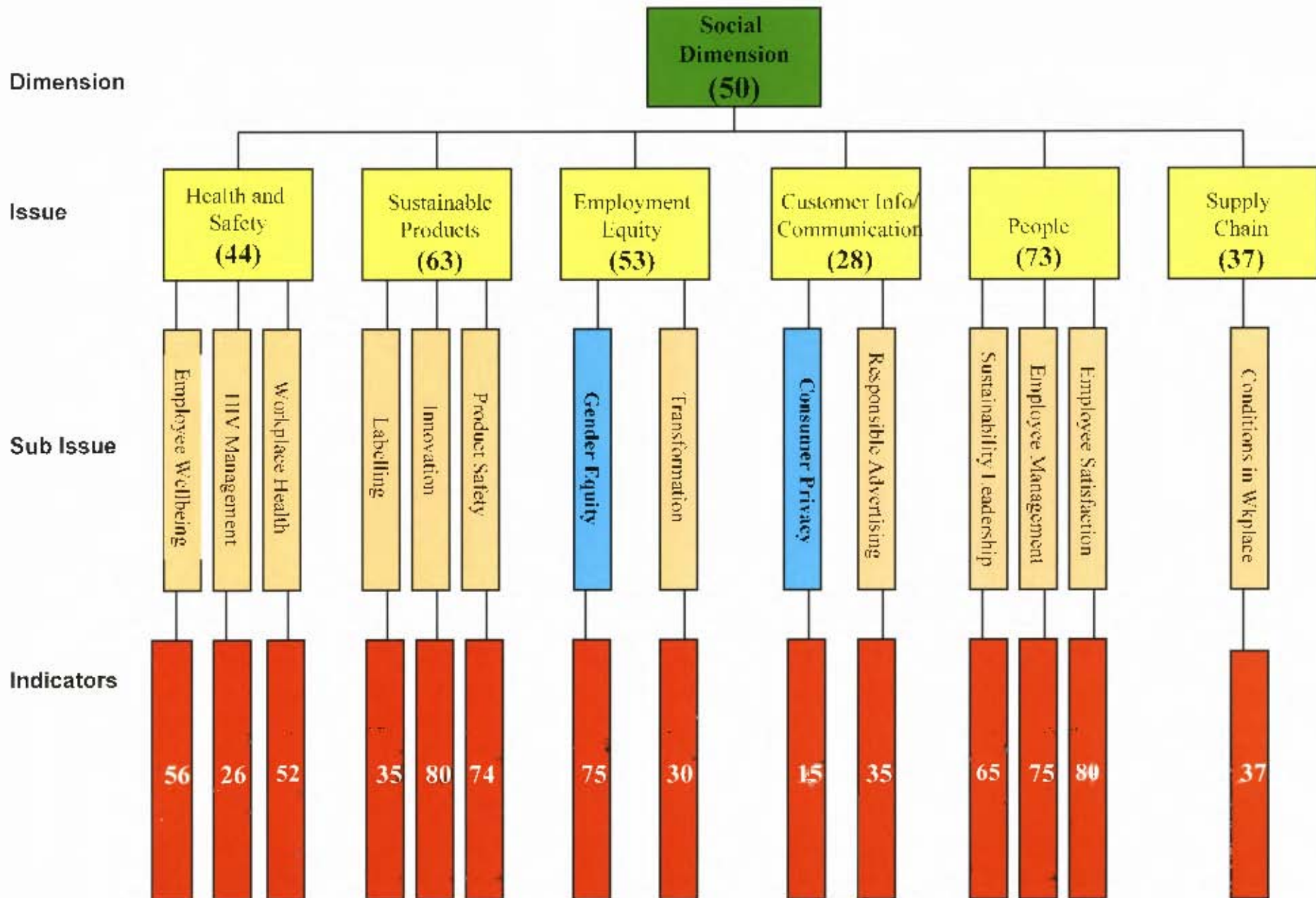


Fig. 14. Hierarchical tier with corresponding BOS scores

This example has focused exclusively on the social dimension however; the process must be repeated for the other 3 dimensions as well. The final numerical output for the Social Dimension was calculated to be 50/100. The following outputs can be used to illustrate the data in a graphical format. Depending on the level of detail of information displayed, the outputs can be used to inform stakeholders at different levels of the decision-making hierarchy.

Figure 15 shows the social pillar of sustainability and the sustainability score for each of the sub-issues. This graphical representation has been designed to provide sustainability information that informs managers at an operational level. Figure 16 summarises sustainability at the issue level for all four pillars of sustainability. It provides a 'mid-level' evaluation of sustainability and highlights key areas for improvement.

The above hypothetical illustration produced an overall index score of 50/100 for the Social Dimension. This process would need to be repeated for the remaining three pillars of sustainability in order to produce an overall sustainability index score for the company as a whole. The final graphical output (Figure. 17) below presents the overall sustainability scores for each pillar of sustainability. For the purpose of illustrating this output hypothetical scores for the remaining 3 pillars were created. They are as follows; Economic Dimension: 81/100, Institutional Dimension: 49/100, and Environmental Dimension: 40/100. This output provides a simplified presentation of overall company level sustainability performance. The output is a suitable representation for sustainability reporting purposes and should be used to inform shareholders of overall sustainability performance in the company from one review period to the next.

## 2006 SUSTAINABILITY PERFORMANCE - SOCIAL DIMENSION

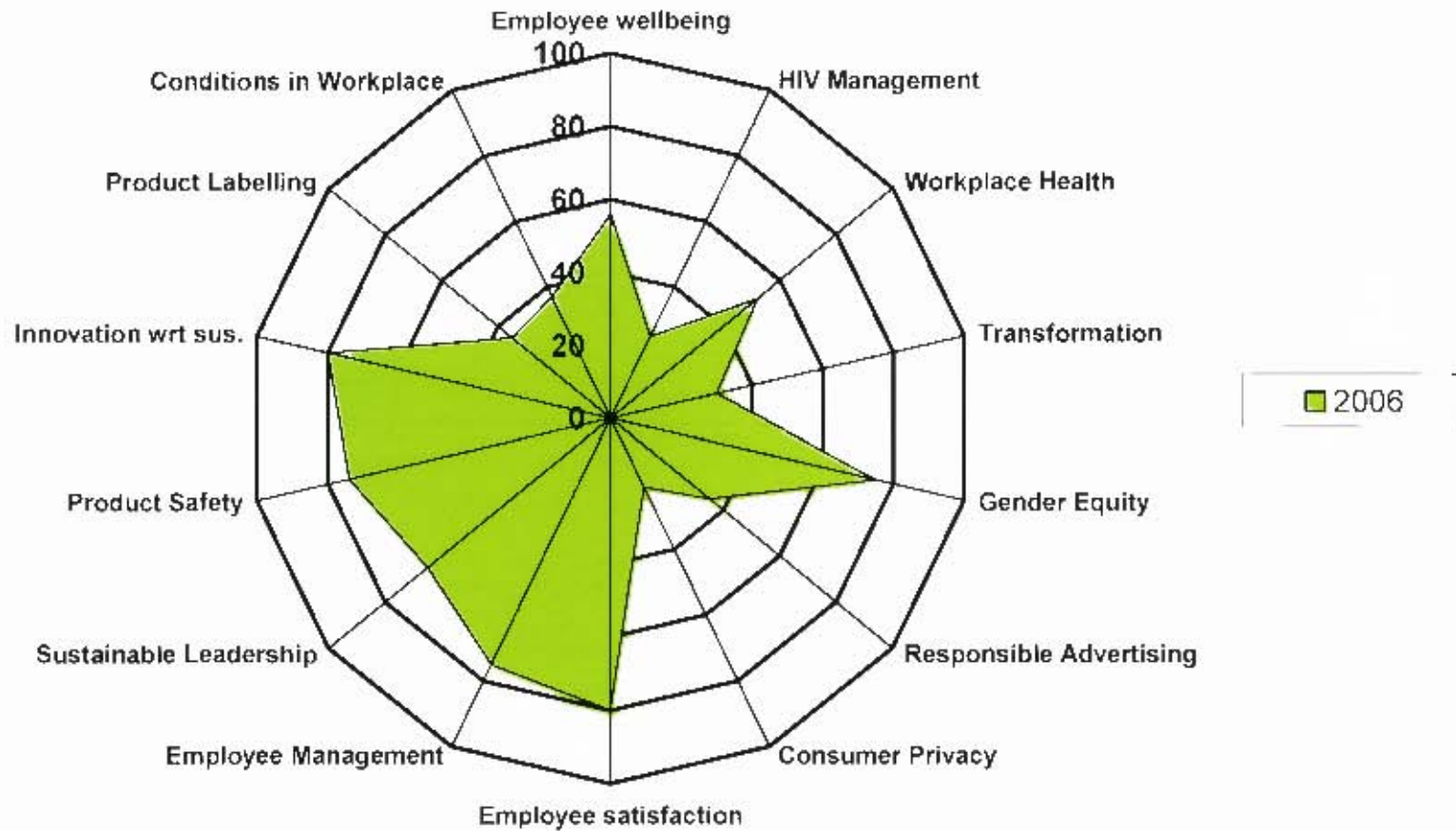
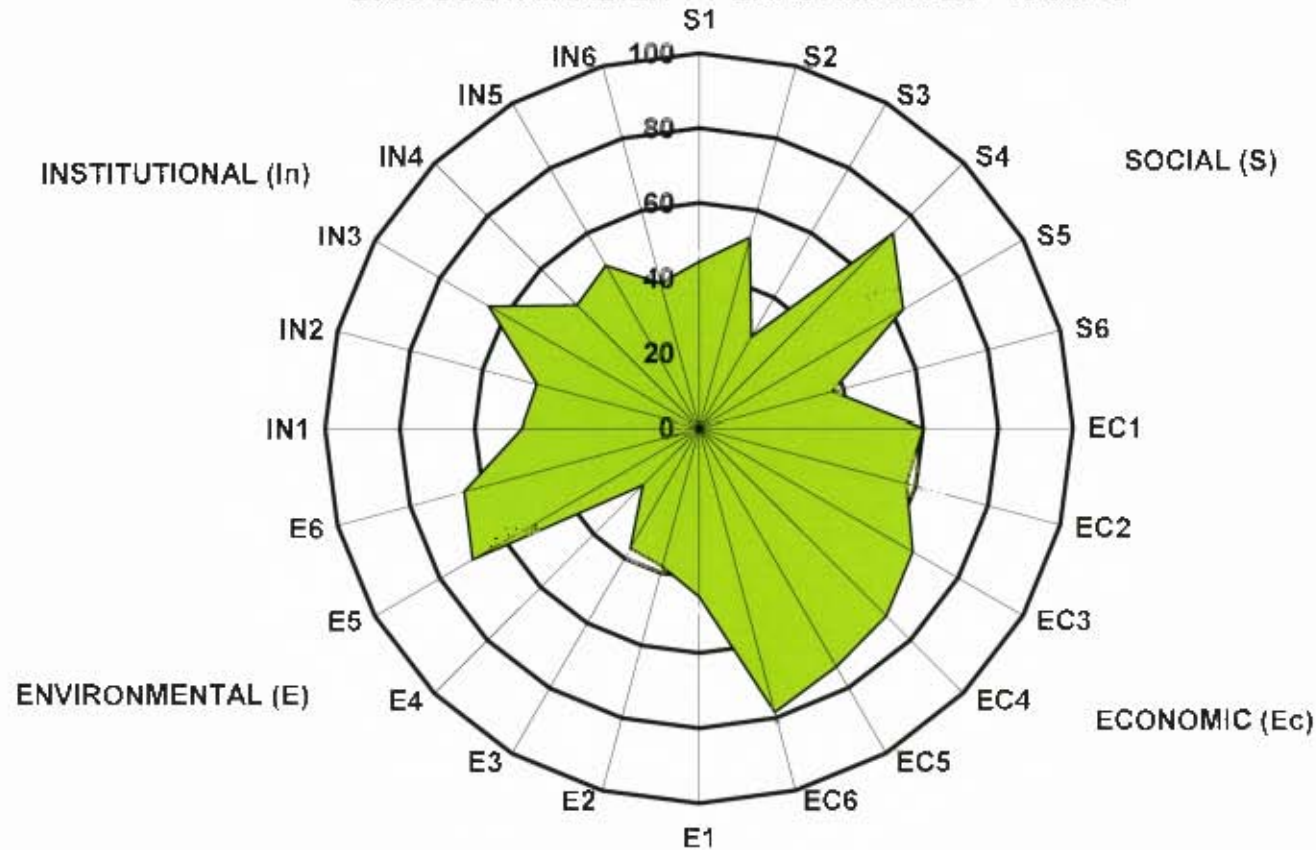


Fig. 15 Radar Graphical representation of Social dimension

### 2006 SUSTAINABILITY PERFORMANCES - ISSUES

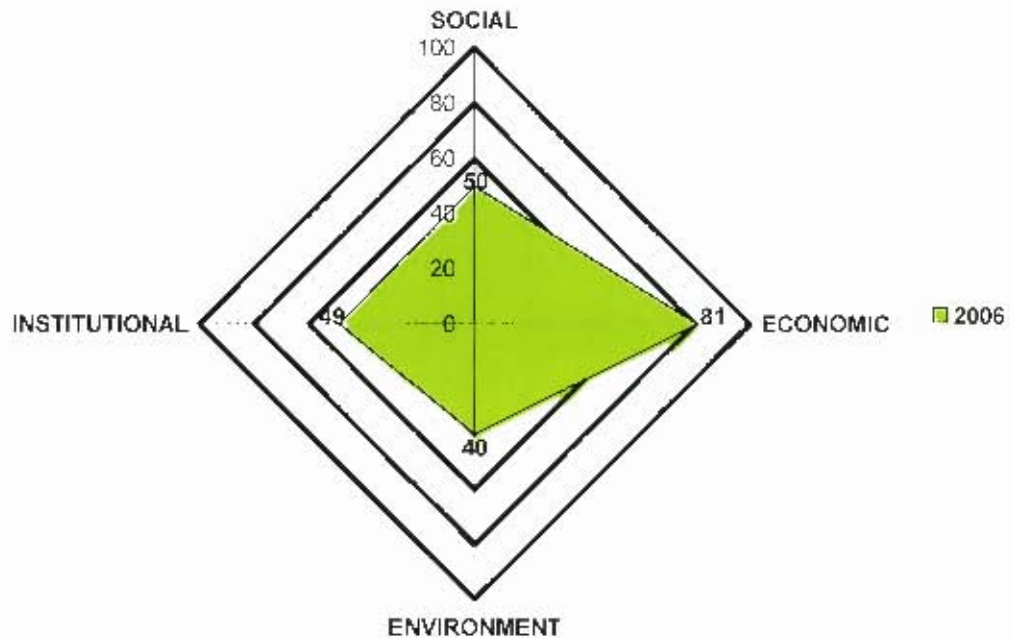


2006

Social	Issue
S1	Health and Safety
S2	Sustainable Products
S3	Employment Equity
S4	Customer Information & Communication
S5	People
S6	Supply Chain
<b>Economic</b>	
EC1	Local Procurement
EC2	Financial Assistance from Gov
EC3	Employee Benefits
EC4	Supply Chain
EC5	Disclosure of Financial Information
EC6	Corporate Social Investment
<b>Environment</b>	
E1	Biodiversity
E2	Energy Usage
E3	Noise Management
E4	Waste Management
E5	Air Pollution
E6	Water Usage
<b>Institutional</b>	
IN1	Governance Structures
IN2	Risk Management
IN3	Sustainability Reporting
IN4	Business Ethics
IN5	Accounting and Auditing
IN6	Compliance and Enforcement

Fig. 16. Radar graphical representation of Issue level

## 2006 COMPANY SUSTAINABILITY PERFORMANCE - DIMENSIONS



**Fig. 17.** Sustainability Diamond showing Dimension Level

This chapter has provided an illustrative example of the adapted methodology of the Barometer. It has applied the calculation and aggregation processes described in Chapter 6, and has illustrated a significant adaptation of the graphical representation of the barometer. Having three different graphical representations that may be used for differing levels of sustainability decision-making is a key methodological advancement made by this dissertation.

The following chapter provides an overview of the methodological procedure for a company to follow in managing sustainability, and thus provides a broad overview of the methodology proposed by this dissertation.

# Chapter 9

## 9. Methodological Summation

This chapter provides a procedural framework for companies wanting to operationalise corporate sustainability, and as such provides a brief overview of the methodological process of this dissertation. It takes a potential user through the process of applying key steps for designing and implementing a Sustainability Management System (SMS) and Composite Sustainable Development Indicator Framework (CSDI).

The application of key overarching principles is a useful method of setting guiding standards for the implementation of both an SMS and CSDI. Such principles are a pragmatic expression of core values and serve as practical guidelines for the whole assessment process. It must be emphasized that the overarching principles mentioned below are intended to highlight key considerations and are by no means a comprehensive list. A sustainability assessment should adopt the following guiding principles:

- **A holistic perspective**
- **Adequate scope**
- **An open and participatory approach**
- **Effective communication structures**
- **Adequate institutional capacity**
- **An on-going assessment approach**

### 9.1 The Implementation of an SMS

This is a procedural framework for the conceptualisation, design and implementation of an SMS. This summary is by no means exhaustive but aims to highlight key steps for the implementations of an SMS.

### **Overarching Requirement:**

**The full commitment of executive, top-level and middle management to achieve an organization's sustainability goals and objectives.**

1. The use of scientifically sound sustainability theories and methodologies as a guiding framework for operationalising sustainability.
2. The selection and application of the principles of corporate sustainability to set the objective and goals of a sustainability initiative.
3. The creation of a sustainability index through the process of mutual adjustment between the various stakeholders involved.
4. The creation of a user-friendly information database to capture and update the current and future sustainability policies, management strategies and indicators.
5. The use of a practical method of ranking indicators to ensure the timeous implementation of sustainability goals and objectives.
6. To ensure that the responsibility of each indicator is delegated to an individual who has the best knowledge, experience and capabilities to implement and manage it within the organisation.
7. To ensure that the information for each indicator is captured within the information database to allow for its efficient delivery into the CSDI framework for its display and strategic feedback into the SMS.
8. To ensure that the sustainability information is reviewed and fed back into the management system.

## **9.2 The Implementation of a CSDI**

A conceptual framework is required that accommodates these and the general principles mentioned at the start of this summary. This is a procedural framework for the conceptualisation, design and implementation of a CSDI: The application of the following guiding principles ensures the CSDI remains practical within the corporate environment:

- **It must be accommodated within the current organizational structure**
- **It must accommodate the fundamental imperative of profit**
- **It must aid strategic decision-making**
- **It must accommodate an organisation's specific corporate identity**

1. **Identify the system:** The scope of the assessment (i.e. the four-pillar approach).
2. **Identify the sustainability dimensions:** e.g. economic, environmental and social and institutional components of sustainability.
3. **Identify the issues and sub-issues:** The key concerns that must be considered to get an adequate sense of the state of each dimension.
4. **Identify the sustainability Indicators:** Identify the measurable aspects of each issue.
5. **Set-up a performance scale for each indicator:** Clearly define the standards of achievement for each indicator.
6. **Convert values on each indicator performance scale to points on the BOS scale.**
7. **Combining/aggregate indicator scores.**
8. **Develop corporate sustainability assessment maps.**
9. **Review results and propose policies.**
10. **Extend sustainability assessment overtime**

The above methodological summation is by no means a complete framework and has been presented as a practical conceptual framework for implementing sustainability assessment within an organisation. It has provided a brief overview of the methodology of this dissertation.

# Chapter 10

## 10. Summary and Conclusions

The impetus for this dissertation came from the involvement of the research group in the development of a Sustainability Management System within a retail organization. During such work it became apparent that research was needed into a Composite Sustainable Development Indicator suited for the particular requirements of a corporate retail context.

### 10.1 Aims and Objectives of the Study

The aims and objectives of this study were as follows:

- Develop a logical and coherent argument from the broad theoretical underpinnings of key sustainability concepts through to specific sustainability issues aimed directly at retail organisations.
- Develop a practical Composite Sustainable Development Indicator (CSDI) Framework and operational model that is both theoretically sound and practically applicable within a retail context.
- Adapt the Barometer of Sustainability from its current focus at regional and national levels, to the corporate organisational level.

Chapters 2 through 8 each fulfilled the first aim to varying extents, although chapters 3, 4 and 5 were more heavily focused on theoretical issues. Even though chapters 5,6, and 7 contributed more to the second aim, the preceding chapters made significant contributions to them, as well as to the chapters that followed them. Chapters 6 and 7, which were also significantly influenced by the work from the preceding chapters, largely met the third aim.

### 10.2 Chapter 2

The chapter described the background context to the study, which highlighted the need for a Composite Sustainable Development Indicator to function within a broader Sustainability Management System (SMS). Distinction between an EMS and SMS was made, and an SMS was defined as 'a system that manages the planning, implementation, collection,

review and feedback of environmental information into an organisation'. The chapter provided a description of a generic SMS framework for Companies to operationalise sustainability from a strategic management level.

The framework included the essential element of setting goals and standards, and the commitment required from top-level management as part of an approach based on the principle of continual improvement from the International Organisation for Standardisation. The rationale behind the principle of continual improvement is to ensure that an organization sets itself a number of achievable goals that are continually redefined to ensure that it continually moves toward becoming a more sustainable enterprise. It was argued that an SMS is therefore a tool to help companies systematically identify, measure and manage their sustainability objectives and goals.

### 10.3 Chapter 3

The concept of Sustainable Development evolved out of a set of beliefs, values and concepts that to root in the 1960's under the banner of environmentalism (O'Riordan and Preston-Whyte, 1998). The United Nations Conference on the Human Environment, held in Stockholm in 1972 marked the coming of age of the environmental movement and legitimised the importance of environmental issues in international relations (Thomas, 1992). This growing awareness of the environmental constraints to human development catalysed a move towards adopting more sustainable solutions with respect to development. The global adoption of sustainable development, symbolized by the United Nations World Conference on the Environment and Development in Rio de Janeiro (1992), marked the beginning of a new era (Wilson *et al.* 2006). This global drive to seeking more sustainable solutions to current development patterns applied pressure to the business world to become more accountable for their development choices and helped ensure that the term sustainable development became increasingly relevant in the agendas of corporate executives (Moneva *et al.* 2006).

Business interest groups actively sought to tame the concept of sustainable development to mean no more than a level of social and environmental engagement that corporations can easily accommodate (Laine, 2005). Therefore, If sustainability is to be taken seriously by businesses, there needs to be a clear process that makes explicit the costs and benefits to the biophysical, social, economic, environmental, and institutional

environments. This four-pillared approach to sustainable development is a holistic and practical method of measuring and reporting on sustainability issues and goes beyond the common 'triple bottom line approach' to ensure that the institutional elements of a company are also integrated into sustainability assessments.

## 10.4 Chapter 4

Corporate Sustainability has gained momentum in a practical context over the last decade. The chapter argued that because of the significant role that the retail organisation plays in influencing production and consumption patterns, the retail industry has a responsibility in influencing the sustainability behaviour of their supply chain and the end consumer. Corporate Sustainability involves the strategic management of the social, environmental, institutional and economic components of the business. It emphasizes not only the ethical and societal obligation of companies to their stakeholders but also the deep-rooted business benefits of managing the company's non-financial risks.

The second part of the chapter dealt with how retailers have understood the importance of engaging in sustainable strategies. This has been evidenced by the numerous examples of initiatives they have undertaken to address environmental and ethical concerns – not only as a forced response by society and shareholder interests, but often as a voluntary step.

Retail companies who perceive Corporate Sustainability as a potential competitive advantage and a 'must have' rather than a 'nice to have', often seek to establish sustainability responsibility into executive level strategic planning process. It was argued that even though valuable time and company resources are increasingly invested into implementing sustainability motivated programmes, there are limited systems in place to monitor and measure the performance outcomes of these efforts. Benchmarks like the AA1000 framework, ISO series and GRI reporting Guidelines have aimed to standardize the management framework whereby overall performance is converted into a vague sustainability index such as the FTSE4Good Index in the United Kingdom or the JSE Socially Responsible Investment index in South Africa.

Although these indices provide some indication of how company level sustainability performance compares with competitive companies, research has shown that companies who subscribe to these indices are more interested in the reputation that comes with an index rating rather than the likelihood of additional investment (Triologue, 2005). Therefore the ability of these indices to provide strategic and informative information to managers about sustainability performance overtime is very limited. This limitation has provided the opportunity of developing a tool that can assemble company wide sustainability information and represent it in a well-summarized format to inform shareholders of overall sustainability performance as well as assist in strategic level decision-making.

## 10.5 Chapter 5

This chapter was concerned with the operationalisation of sustainability through a particular kind of sustainability assessment, namely a Composite Sustainability Development Indicator. Although there has been limited research and development of aggregated indexes for a corporate entity, there is still no useful method available for integrated sustainability assessment at the company level available (Krajnc and Glavic 2005). To meet the challenges of sustainability, an approach for integrated assessment of a company is required to provide good guidance for decision-making. It was argued that if sustainability is to be taken seriously by businesses, there needs to be a clear process that makes explicit the costs and benefits to the social, economic environmental, and institutional dimensions or pillars of sustainable development, while remaining practical and informing and improving decision-making.

The Chapter's particular focus was on the selection of a conceptual and methodological framework for a CSDI. As explained in Chapter 2, such an assessment tool would fit within the context of a Sustainability Management System or an SMS. An important distinction was made between reporting and assessment, in that companies wanting to take a stronger approach to sustainability need to move from the realm of reporting into more rigorous assessment.

The chapter then dealt with general and specific criteria based on broad principles of sustainability assessment. These were included as an overall guide for the construction of a framework for a CSDI. The principles were compiled from a number of sources, but were

mainly based on the values proposed by the Bellagio Principles. In creating the framework for a CSDI, the criteria and the principles they were based on served as important evaluative sounding boards for the selection and combination of two conceptual frameworks. These were selected after a brief discussion of existing sustainability assessment frameworks, and a summary of the findings of two typological evaluations of such frameworks. A four-pillared thematic conceptual model of sustainability and a hierarchical organizational framework were selected. The methodological advantages of these were argued, and the principles they fulfilled were summarised. They were also placed within the context of sustainability assessment in a corporate environment and within the legislative environment of South Africa.

The four pillars or dimensions of sustainability were then characterised, and the existing theoretical linkages between them were explained. This was done in order to give a theoretical basis to the corporate sustainability issues that were organised under each pillar in Chapter 4 and which were applied in the identification of issues and selection of indicators in the illustrative example in Chapter 8.

The next part of the chapter dealt with the evaluation, review, assessment and selection of composite indices. It was argued that the use of a Composite Sustainability Index (CSDI) could provide a framework for decision makers to link the many sustainability issues together and reduce the number of decision-making criteria to be considered in the process. The pros and cons of such tools were discussed briefly. The justification for a composite indicator lies in its fitness to the intended purpose and the acceptance of peers (Rosen 1991). In order for them not to send misleading messages they need to be carefully constructed and explicit in their methodological and conceptual foundations.

This dissertation aimed to contribute to a better understanding of the complexity of composite indicators and to an improvement of the techniques currently used to construct them for a corporate context.

Although many popular SDIs propose their frameworks and methods in ways that allow adaptation for differing contexts (Bellagio Principles: Hardi et al. 1997, Barometer of Sustainability: Prescott – Allen 2001, OECD Guidelines: Nardo et al. 2005) there was not much guidance on exactly how to go about adapting the tools for the particularities of a corporate context.

The chapter provided a brief review, assessment and evaluation of composite indices that have already been developed in order to supplement the review of existing work in this sphere, and in order to provide some methodological guidance on constructing a composite index. Yet the main purpose for including the review of existing composite models was in order to provide reasoning for the selection of a methodological framework that would serve as the skeleton for the creation of a new adapted operational framework that was ideally suited to the requirements of a corporate retail entity.

Four composite models were discussed briefly. They were then evaluated on the basis of the principles outlined in Section 5.4 of the chapter. The assessment was included in a table showing advantages and disadvantages, which were based on the extent to which specific methodological aspects of the model met or did not meet the Principles and Criteria stated in Section 5.4 respectively. The first assessment was accompanied by another table that scored the performance of each model based on its fulfilment of each of the stated principles. The scores given were an aggregate of the research group's opinions.

Specific aspects of the Barometer of Sustainability were found to comply most successfully with the principles and criteria applied in the assessment and evaluation. The Barometer, in an adapted format could also, easily accommodate the conceptual framework of a four-pillared approach to sustainability.

## 10.6 Chapter 6

This chapter introduced the background and origins of the Barometer, and explained its basic methodological principles. It began by justifying the need for the barometer within the context of assessing sustainability in a corporate environment. The barometer essentially acts as a performance scale that enabled a composite aggregation of disparate indicators. As mentioned in Chapter 5, a key challenge for sustainability assessment at the corporate level is the aggregation of indicators into a composite index. Since indicators measure completely different things, combining them in a way that communicates meaningful information may be like combining apples and oranges. Thus, the methodology of the barometer proposes a procedure for the conversion of indicator values to performance values on the barometer scale.

It was emphasized that having chosen the indicators, it is necessary to then obtain the data for each of them. As noted by Prescott-Allen (2001), the assessment needs to set up its own data base; make arrangements with sources of existing data to receive them regularly; and organize surveys and monitoring systems for any indicator requiring data not currently collected. An example of such a system was presented in the background information section, which outlines the implementation of a Sustainability management System (SMS).

Such procedures take the form of mathematical conversions, which were explained in detail within the chapter. The majority of work within this methodological framework involves the setting of a performance scale. A key methodological premise of the performance scale is based on the ideology, that converting indicators scores to the BOS scale maintains a process of clearly defining what is meant by progress in sustainability. That is, people need to state explicitly their assumptions about the significance of the indicator in the context in which it is being used, and the levels of achievement that will be ideal, desirable, acceptable or disastrous (IUCN, 1997, p.10). To do otherwise would be to allow the scale to make the decisions by applying a formula rather than struggle to think things out.

The chapter then provided an explanation of how correspondence is achieved between the indicator values and the Barometer scale. This was followed by the mathematical formulae required to convert indicator scores to the Barometer. Suggestions for aggregation were given, which allow for users to use whichever weighting system they desire:

- If users consider the indicators to be equally important, then the indicators are added together and then the average taken;
- If some of the indicators are regarded as being more important than others, then they need to be weighted according to their relative importance before they are added and averaged; or
- If one indicator is regarded to be critical, it can be given a veto function, over the other indicators.

The creation of assessment maps was then introduced, where the benefits of such tools were explained. In this dissertation, three graphical models have replaced the two axis

graphical representation which are: 1) Indicator level Corporate Sustainability Radar (for illustrating the levels of sustainability of individual indicators within one particular dimension); 2) Detailed dimension Corporate Sustainability Radar (for illustrating indicator values for all four dimensions); and 3) Corporate Sustainability Diamond (for illustrating the overall aggregated level of sustainability of the economic, social, institutional and environmental dimensions). As already mentioned the BOS scale could also be used to illustrate sustainability on a two-component axis, at the human and ecosystem level if need be. Examples of the radar charts were included in the illustrative example in Chapter 8.

Emphasis was placed on the importance of reviewing results and proposing policies, as this connects the assessment to action and reveals the dimensions that most need improvement. Further analysis could be done to identify the issues and sub-issues requiring priority attention; causes of the main problems; and what policy actions are needed in response as well as extending sustainability over time in order to facilitate the monitoring of progress towards (or away from) sustainability.

Extending Sustainability over time is crucial for the ongoing management of sustainability issues and the achievement of sustainability goals. This involves the continuous collection, organization and analysis of information.

The chapter concluded with a statement of the value-based or subjective nature of the methodology. Value judgments cannot be avoided when assessing sustainability. Such values influence all parts of the assessment process from the model of the system and the goal, through to making decisions about aggregation, and to the interpretation of indicators (IUCN, 1997, p. 29). The important thing to remember is that values and judgments must be made very clear, so that it may be seen how alternative judgments would alter the assessment (IUCN, 1997, p. 29).

## 10.7 Chapter 7

This chapter provided a brief overview of the methodological adaptations of the barometer that have been made in order for it to accommodate a corporate context. The main reasons for the selection of the Barometer were re-stated. The two key adaptations that had been made to the Barometer were as follows:

- Focus on the dimension level of sustainability instead of a two-component sub-system level
- Graphical Representation altered to reflect change in focus of conceptual basis from a two-axis output to a four-axis output.

The theoretical basis for the adaptive process was included. The reasoning for the major adaptation, i.e. the substitution of the requirement for a two-component sub-system level for a four-pillared thematic model was re-iterated. This conceptual adaptation was reflected in an alternative graphic representation, presented in Chapter 8.

The major methodological advancements made by the dissertation were as follows

- Procedure for users to create an SMS based on adaptive management
- Development of a four-pillared conceptual framework for the assessment of sustainability within a corporate entity
- Inclusion of methodology for a Composite Sustainable Development Indicator
- Development of radar charts and sustainability diamond for reporting of sustainability information at different levels of decision-making.

## 10.8 Chapter 8

This chapter provided an illustrative example of an application of the conceptual framework described in chapter 5, and the adapted methodology discussed in chapters 6 and 7. The chapter aimed to briefly illustrate how the CSDI could be applied within the framework of a Sustainability Management System (SMS) and how sustainability information could be presented in a practical and usable format.

The chapter applied the performance scale, calculation and aggregation methods explained in Chapter 6 for two examples that both fall within the Social Dimension of sustainability. The chapter proposed the use of simple graphical outputs to map a company's sustainability performance with respect to the four-pillars of sustainability.

The figures demonstrated how detailed graphical outputs are more effective than the single point assessment method used by the BOS, for determining sustainability performance and sustainability outcomes. The 'Sub issue' and 'Issue' models present the detailed sustainability information, while the 'Dimension' model represents a holistic and simplified account of overall sustainability. The more detailed models have been designed to assist management in strategic and policy decision-making, whereas the simpler model would be more helpful in informing shareholders and the general public of overall sustainability performance.

The main purpose of these graphical models is not to see if one retail organisation is performing better than its competitors but rather, to determine if it is doing well on its own measured against its personal expectations. The models provide a flexible framework for individual company's to display sustainability characteristics of that particular organisation. Therefore the issues and corresponding indicators will vary from one organisation to the next, depending on the characteristics of that organisation, level of sustainability commitment as well as its unique value system. Managers however are encouraged to report on the main sustainability issues highlighted previously in Figure 3, Chapter 4 and choose matching indicators that will portray the performance of those issues in a reliable, accurate and objective light.

It must be noted that the models can be used as a tool for comparing sustainability performance from one organisation to the next, if a uniform set of indicators are used between companies.

Determining sustainability requires a sequential assessment process over a period of time (Ko, 2005). In practice it is anticipated that data should be collected and the models will be compiled on a periodic basis, to monitor progress in achieving Corporate Sustainability objectives. This way, recent performance can be compared against previous levels of performance, and an overall understanding of progress toward or away from sustainability

can be determined. It is also anticipated that the issues and indicators will change overtime, however they can only be changed by managers together in discussion and consultation with relevant stakeholders, to ensure that the overall integrity of the system is maintained.

## 10.9 Chapter 9

This chapter provided a brief overview of the entire methodological process that a company could follow in managing sustainability. Firstly the procedure for creating an SMS was given in a point form procedure, and secondly the procedure for creating a CSDI was given. In so doing it the chapter provides a brief overview of the practical or applied methodological aspects proposed by this dissertation.

# Reference List

1. Agarwal B (2001) Participatory Exclusions, Community Forestry, and Gender: An Analysis for South Asia and Conceptual Framework. *World Development*, 29 (10) 1623-1648.
2. Alexander C (1964) *Notes on the Synthesis of Form*. Cambridge, Massachusetts: Harvard University Press.
3. Alexander G and Buchholz R (1982) Corporate Social Responsibility and Stock Market Performance. *Academy of Management Journal*, 21, 479-86.
4. Atkinson G (2000) Measuring Corporate Sustainability. *Journal of Environmental Planning and Management*, 43 (2) 235–252.
5. Atkisson A and Hatcher R (2001) *Journal of Environmental Assessment Policy and Management*, 3 (4) 509-532: Imperial College Press.
6. Azapagic A (2004) *Developing a Framework for Sustainable Development Indicators for the Mining and Minerals Industry*. *J. Clean. Prod.*, 12, 639-662.
7. Azapagic A and Perdan S (2000) Indicators of Sustainable Development for Industry: A General Framework. *Trans IChemE (Pro Safety Envir Prot) Part B*, 78 (4) 243-61.
8. Baker S, Kousis M, Richardson D and Young S (1997) *The Politics of Sustainable Development: Theory, Policy and Practice within the European Union*. London: Routledge.
9. Baron D (2000) *Business and its Environment*. 3<sup>rd</sup> Edition. Upper Saddle River, NJ: Prentice Hall.
10. Baumgartner S (2006) Sustainability Performance of Corporations: Comparison of Assessment Methods. *Journal of Environmental Economics and Investment Assessment*, 98, 1-10.
11. Beddington J (2001) Sustainable development: A Review of the International Development, Business and Accounting Literature. *Accounting Forum*, 25 (2) 128-157.
12. Bellows B C (1995) *Principles and Practices for Implementing Participatory and Intersectoral Assessments of Indicators of Sustainability: Outputs from the Workshop Sessions SANREM CRSP Conference on Indicators of Sustainability, Sustainable Agriculture and Natural Resource Management Collaborative Research Support Program Research Report*, 1/95, 243–268.

13. Benn S and Dunphy D (2003) *Integrating Human and Ecological Factors: a Systematic Approach to Corporate Sustainability*. Paper presentation at Academy of Management Conference, Seattle.
14. Bossel H (1998) *Earth at a Crossroads: Paths to a Sustainable Future*. Cambridge University Press, Cambridge.
15. Bossel H (1999) *Indicators for Sustainable Development: Theory, Method, Applications*. A Report to the Balaton Group, IISD, Canada.
16. Bossel H (2001) Assessing Viability and Sustainability: A Systems-based Approach for Deriving Comprehensive Indicator Sets. *Conservation Ecology*, 5, 12.
17. Brown R, Shapiro K, Lim S and York J (2005) Sustainability Appraisal of Nature Conservation in the Knersvlakte. Unpublished Masters Thesis, University of Cape Town.
18. Caldwell L K (1992) *Between Two Worlds: Science, the Environmental Movement and Policy Choice*. Cambridge: Cambridge University Press.
19. Carson R (1962) *Silent Spring*. Boston: Houghton Mifflin.
20. Chambers R (2002) *Participatory Workshops: a Sourcebook of 21 Sets of Ideas and Activities*. Earthscan, London.
21. Checkland P (1981) *Systems Thinking, Systems Practice*. John Wiley, Chichester.
22. Clayton A M H & Radcliffe N J (1996) *Sustainability: A System Approach*. London, Earthscan.
23. Clements R B (1996) *Complete Guide to ISO 14000*. Upper Saddle River, New Jersey: Prentice Hall.
24. Commission of the European Communities (COM) (2006) *Communication from the Commission to the European Parliament, the Council and the European Economic and Social Committee*. Brussels.
25. Cox R and Brittain P (2004) *Retailing and Introduction*. 5<sup>th</sup> Edition. FT Prentice Hall.
26. Daly H E (1997) *Sustainable Development: Definitions, Principles, Policies*. The World Bank, Washington, D.C.
27. Daub C H (2005) Assessing the Quality of Sustainability Reporting: An Alternative Methodological Approach. *Journal of Cleaner Production*. 1(11).
28. Delloites (2006) The Global Powers of Retailing. Managing Risk and Reward: New Powers of Retail Leadership. *Stores Journal*.

29. Douglas M (1972) Environment at Risk. In Benthall J (ed) *Ecology: The Shaping Inquiry*. Toronto: Longman.
30. Dowell G; Hart S and Yeung B (2000) Do Corporate Global Environmental Standards Create or Destroy Market Value? *Management Science*, 46 (8) 1059-74.
31. Durieu X (2003) How Europe's Retail Sector Helps Promote Sustainable Production and Consumption. *United Nations Environmental Programme. Industry and Environment*, 26 (1) 7-9.
32. Epstein M and Roy M (2001) Sustainability in Action: Identifying and Measuring the Key Performance Drivers. *Long Range Planning*, 34, 586-604.
33. Faludi A (1987) *A Decision-centred View of Environmental Planning*. Oxford: Pergamon.
34. Farsari Y and Prastacos P (2006) Sustainable Development Indicators: An Overview. On-line at: <http://www.iacm.forth.gr/regional/papers/Asteras-English.pdf#search=%22sustainable%20development%20indicators%20by%20Yianna%20Farsari%20and%20Prastacos%22> (last visited 12 October 2006).
35. Fraser E (2002) Urban Ecology in Bangkok, Thailand: Community Participation, Urban Agriculture and Forestry. *Environments* 30, 37-49.
36. Fraser E (2003) Social Vulnerability and Ecological Fragility: Building Bridges Between Social and Natural Sciences Using the Irish Potato Famine as a Case Study. *Conservation Ecology* 7.
37. Freeman R E (1984) *Strategic management: A stakeholder approach*. Boston: Pitman.
38. Gladwin T N, Kennelly J J and Krause T S (1995) Beyond Eco-Efficiency: Towards Socially Sustainable Business. *Sustainable Development*, 3, 35-43.
39. Global Reporting Initiative (GRI) (2002) *Sustainability Reporting Guidelines 2002 on Economic, Environmental and Social Performance*. Global Reporting Initiative, Boston, USA. On-line at: <http://www.globalreporting.org> (last visited 13 July 2006).
40. Gorrell J M (1981) The Explanatory, Heuristic and Meaning-Constituting Functions of Theoretical Models. PhD Thesis, Brown University.
41. Gray R, Beddington J and Walters D (1993) *Accounting for the environment*. London: Paul Chapman Publishing Ltd.
42. GRI – Global Reporting Initiative (2002) *Sustainability Reporting Guidelines on Economic, Environmental and Social Performance*. Global Reporting Initiative,

- Boston, USA. On-line at: <http://www.globalreporting.org> (last visited September 2006).
43. Guijt I and Moiseev A (2001) *Resource Kit for Sustainability Assessment*, IUCN, Gland, Switzerland and Cambridge, UK. Part A x+ 83pp., Part B viii + 172 pp., Part C iv+ 92pp.
  44. Gunderson L and Holling C S (2002) *Panarchy: Understanding Transformations in Human and Natural Systems*. Island Press, Washington.
  45. Hardi, P et al (1997) *Assessing sustainable development: Principles in practice*. Winnipeg: The International Institute for Sustainable Development. 1<sup>st</sup> Principle.
  46. Hart S, and Ahuja G (2001) Does it pay to be green? An empirical examination of the relationship between emission reduction and firm performance. *Business, Strategy and the Environment*, 5, 30-7.
  47. Hawkins D (2006) *Corporate Social Responsibility. Balancing Tomorrows Sustainability and Today's Profitability*. Palgrave Macmillan Ltd, New York.
  48. Hill R and Bowen A (1997). Sustainable Construction: Principles and a Framework for Attainment. *Construction Management and Economics*, 15, 223-239.
  49. Hill R C (2003) *Civic Friends Crossing Back and Forth*. Newsletter of the International Association for Impact Assessment, IAIA South Africa.
  50. Hill R C (2004) *Theory for the Practice of Environmental Assessment: Mutual Adjustment, Critical Rationality, and Power in Planning and Decision-Making*. Unpublished PhD thesis, University of Cape Town.
  51. Hill R C and Bowen P A (1997) Sustainable construction: principles and a framework for attainment. *Construction Management and Economics* 15 (3) 223-239.
  52. Hodge R A (1996) A Systemic Approach to Assessing Progress Toward Sustainability. In A. Dale, & J. B. Robinson (Eds.), *Achieving Sustainable Development*, Vancouver, UBC Press, pp267-297.
  53. Holling C S (1978) *Adaptive Environmental Assessment and Management*. John Wiley and Sons, New York.
  54. International Union for Conservation of Nature and Natural Resources (IUCN) (1997) *An Approach to Assessing Progress Towards Sustainability – Tools and Training Series*. Prepared by the IUCN/IDRC International Assessment Team and Pilot Country Teams in Colombia, India and Zimbabwe.

55. International Union for Conservation of Nature and Natural Resources (IUCN) (1991) *Caring for the Earth. A Strategy for Sustainable Living*. Gland Switzerland.
56. Jones P, Comfort D, Hillier D and Eastwood I (2005) Retailers and Sustainable Development in the UK. *International Journal of Retail and Distribution Management*, 23 (3) 207-214.
57. Kaufman F (1944) *Methodology of the Social Sciences*. New Jersey: Humanities Press.
58. Khosla A (1995) Foreword. In T. C. Trzyna (ed.) *A sustainable world: Defining and measuring sustainable development* : pp. 7–9. Sacramento CA: IUCN.
59. Ko T G (2005) Development of a Tourism Sustainability Assessment Procedure: A Conceptual Approach. *Tourism Management*, 26, 431–445.
60. KPMG (2002) *The State of Sustainability Reporting in the Trade and Retail Sector*. KPMG Sustainability Advisory Services Environment Australia.
61. Krajnc D and Glavic P (2005) How to Compare Companies on Relevant Dimensions of Sustainability, *Ecological Economics*, 55, 551- 563.
62. Labuschagne C, Brent A C and van Erck R P G (2005) Assessing the sustainability performances of industries. *Journal of Cleaner Production*, 13, 373 - 385.
63. Laine M (2005) Meanings of the Term `Sustainable Development' in Finnish Corporate Disclosures. *Accounting Forum*, 29, 395 - 413.
64. Lawrence D P (1997b) The Need for EIA Theory-Building. *Environmental Impact Assessment Review*, 17 (2) 79-107.
65. Lee K (1999) Appraising Adaptive Management. *Cons Ecol*, 3 (2), 3.
66. Leopold A (1949) *A Sand County Almanac*. New York: Ballantine Books.
67. Lourdel N Gondran V and Laforest C (2005). Introduction of Sustainable Development in Engineers' Curricula: Problematic and Evaluation Methods. *International Journal of Sustainability in Higher Education* 6 (3) 254- 264.
68. Lourdel N, Gondran V and Laforest C (2005). Brodhag Introduction of Sustainable Development in Engineers' Curricula: Problematic and Evaluation Methods. *International Journal of Sustainability in Higher Education*, 6 (3) 254-264.
69. MacDonald J (2005) Strategic sustainable development using ISO 14001 Standard. *Journal of Cleaner Production*. 13, 631-643.
70. Mannion A M and Bowlby S R (1992) Introduction: A M Mannion and S R Bowlby (Eds.), *Environmental Issues in the 1990s*. Chichester: Wiley, pp3-360.

71. Meadows D H, Randers J and Behrens W W (1972) *Limits to growth*. London: Earth Island.
72. Meadows D, Meadows D and Randers J (1992) *Beyond the Limits*. London: Earthscape Publications.
73. Mebratu D (1998) Sustainability and Sustainable Development: Historical and Conceptual Review. *Environmental Impact Assessment Review*, 18, 493 - 520.
74. Moneva J M, Archel P and Correa C (2006). GRI and the Camouflaging of Corporate Unsustainability, *Accounting Forum*, 30, 121-137.
75. Morhardt J E (2002) *Clean and Green and Read All Over: Ten Rules for Effective Corporate Environmental and Sustainability Reporting*. Milwaukee: American Society for Quality Press.
76. Mouton J (1990) On Values and Objectivity in Social Science. In Mouton J and Joubert D (eds) *Knowledge and Method in the Human Sciences*. Human Sciences Research Council (HSRC) Series in Methodology. Pretoria: Gutenberg.
77. Mouton J and Marais H C (1990) *Basic Concepts in the Methodology of the Social Sciences*. Human Sciences Research Council (HSRC) Series in Methodology. Pretoria: HSRC.
78. Munro D A (1995) Sustainability: Rhetoric or reality? In T. C. Trzyna (Ed.), *A sustainable world: Defining and measuring sustainable development*. Sacramento: IUCN, pp27–35.
79. Nagpal T (1995) Voices from the developing World: Progress Toward Sustainable Development. *Environment*, 35 (8) 10 -35.
80. Nardo et al. 2005 *Handbook on Constructing Composite Indicators: Methodology and User Guide*, OECD Statistics Working Paper, Statistics Directorate.
81. Nelson J (2002) *Building Partnerships. Co-operation between the United Nations System and the Private Sector*. New York, London: United Nations Department of Public Information, International Business Leaders Forum.
82. NEMA - Republic of South Africa (1998) *National Environmental Management Act 107 of 1998*. Government Gazette, vol 4, No. 19519, Nov. 1998.
83. Nick R (1999) Making Sustainability Bite. *Journal of Sustainable Product Design*.
84. Niemeijer D (2002) Developing Indicators for Environmental Policy: Data-driven and Theory-driven Approaches Examined by example. *Environmental Science & Policy*, 5 (2) 91-103.

85. OECD (1993) *OECD Core Set of Indicators for Environmental Performance Reviews. A Synthesis Report by the Group on the State of the Environment*. Organisation for Economic Co-operation and Development, Paris.
86. Organisation for Economic Co-operation and Development (OECD) (2002) An Update of the OECD Composite Leading Indicators. Short term Economic Statistics Division, Statistics Directorate/OECD. Online at: <http://www.oecd.org> (last visited August 2006).
87. O'Riordan T (1981) *Environmentalism*. 2<sup>nd</sup> ed. London: Pion Press.
88. O'Riordan T (1993) *Interpreting the Precautionary Principle*. CSERGE. UEA Norwich.
89. O'Riordan T (1997). *Environmental Science for Environmental Management*. 2<sup>nd</sup> Edition. Essex: Pearson Education Ltd.
90. O'Riordan T and Preston-Whyte R (1998) *The Transition to Sustainability: A South African Perspective*. Unpublished paper.
91. O'Riordan T and Voisey H (1997) *Sustainable Development in Western Europe: Coming to terms with Agenda 21*. London: Frank Cass.
92. Orlitzky M, Schmidt F and Rynes S (2003) Corporate Social and Financial Performance: A Meta Analysis. *Organization Studies Journal*, 24 (3) 403–441
93. Osborn F (1953) *Limits of the Earth*, Boston: Little, Brown and Co.
94. Pearce D (1989) An Economic Perspective on Sustainable Development. *Journal of the Society for International Development*, 2/3, 17-20.
95. Piasecki B W, Fletcher K A and Mendelson F J (1999) *Environmental Management and Business Strategy: Leadership Skills for the 21st Century*, New York: John Wiley and Sons.
96. Pope J, Annandale D and Morrison-Saunders A (2004) Conceptualizing Sustainability Assessment. *Environmental Impact Assessment Review*, 24, 595-616.
97. Porter M E (1990) *The Competitive Advantage of Nations*. MacMillan, London.
98. Prescott-Allen R (2001) *The Wellbeing of Nations: A Country by Country Index of Quality of Life and the Environment*. Island Press, Washington DC.
99. Primeaux P (1997) Business Ethics in Theory and Practice. Diagnostic Notes B. A Prescription for Profit Maximisation. *Journal of Business Ethics*, p16.
100. Rafiq M and Varly R (2003) *Principles of Retail Management*. Palgrave Macmillan, New York.

101. Redcliff M. (1987) *Sustainable Development: Exploring the Contradictions*. London: Methuen.
102. Reed et al. (2006) *An Adaptive Learning Process for Developing and Applying Sustainability Indicators with Local Communities*. Sustainability Research Institute, School of Earth and Environment, University of Leeds, West Yorkshire, United Kingdom.
103. Republic of South Africa (1996) *Constitution of the Republic of South Africa. Act 108 of (1996). Section 24 (b) (iii)*. Republic of South Africa.
104. Republic of South Africa (1998) *National Water Act No 36 of 1998*.
105. Republic of South Africa (2004) *National Environmental Management: Biodiversity Act No 10 of 2004*. Government Gazette, vol 467, No. 26436, June 2005.
106. Republic of South Africa (2004) *National Environmental Management: Air Quality Act No 39 of 2004*. Government Gazette, vol 476, No. 27318, Feb. 2005.
107. Robins N (1999) Making Sustainability Bite: Transforming Global Consumption Patters. *The Journal of Sustainable Product Design*, 10, 7-15.
108. Rosen R (1991) *Life Itself: A Comprehensive Inquiry into Nature, Origin, and Fabrication of Life*. Columbia University Press.
109. Rossouw N and Wiseman K (2004) Learning from the Implementation of Environmental Public Policy Instruments After the First Ten Years of Democracy in South Africa. *Impact Assessment and Project Appraisal*, 22 (2) 131-140.
110. Ruitenbeek J and Carter C (2001) The Invisible Wand: Adaptive Co-management as an Emergent Strategy in Complex Bio-economic Systems. Occasional paper 34. Centre for International Forestry Research, Bogor, Indonesia. On-line at: [http://www.cifor.cgiar.org/publications/pdf\\_files/OccPapers/OP-034.pdf](http://www.cifor.cgiar.org/publications/pdf_files/OccPapers/OP-034.pdf). (Last visited September 2006).
111. SAB – South Africa Breweries (2006) *Sustainable Development Report*. SAB.
112. Saisana M, Tarantola S, Saltelli A (2005) Uncertainty and Sensitivity Techniques as Tools for the Analysis and Validation of Composite Indicators. *The Journal of the Royal Statistical Society A*, 168 (2) 1-17.
113. Salzmann O, Ionescu-Somer A and Steger S (2004) The business case for Corporate Sustainability: Literature Review and Research Options. *European Management Journal*, 23 (1) 27-36.

127. Szekely F and Knirsch M (2005) Responsible Leadership and Corporate Social Responsibility: Metrics for Sustainable Performance. *European Management Journal*, 23 (6) 628-647.
128. The Natural Step (TNS) 2004. The Natural Step. On-line at: <http://www.naturalstep.org/> (last visited September 2006).
129. Thomas C (1992) *The Environment in International Relations*. London, England: Royal Institute of International Affairs.
130. Trialogue (2005) *The Good Corporate Citizen: Pursuing Sustainable Business in South Africa*. 2<sup>nd</sup> Edition. Trialogue, Cape Town.
131. Trialogue (2006) *The Sustainable Business Handbook: Smart Strategies for Responsible Companies*. Trialogue, Cape Town.
132. Ulhoi J (1994) Corporate Environmental and Resource Management: In Search of a New Paradigm. *European Journal of Operational Research*. 80, 2-15.
133. Ulhoi J P, Madsen H and Hildebrandt S (1996) Green New world: A Corporate Environmental Business Perspective. *Scand. J. Mgmt*, 12 (3) 243-254.
134. Ullmann A A (1985) Data in Search of a Theory: A Critical Examination of the Relationships among Social Performance, Social Disclosure and Economic Performance of the U.S. Firms. *Academy of Management Review*, 10 (3), 540-557.
135. United National Environmental Programme (UNEP) (2003) Shopping for a better world: facts and figures. In: Shopping for a better world: sustainability and retailing. *Industry and Environment*, 26 (1).
136. United National Environmental Programme (UNEP) (2006) Production and Consumption Branch. Retail and Environment. On-line at: [http://www.unep.org/pc/retail\\_env.htm](http://www.unep.org/pc/retail_env.htm) (last visited September 2006).
137. United Nations (1992) *Agenda 21: The United Nations Programme of Action from Rio*. United Nations, New York.
138. United Nations Commission on Sustainable Development (UNCSD) (2001) Indicators of Sustainable Development: Framework and Methodologies. Background paper No. 3, United Nations, New York.
139. United Nations Environment Programme (UNEP) (1980) *Choosing the Options: Alternative Lifestyles and Development Patterns*, UNEP Executive Series 2. Nairobi: Afropress.
140. United Nations World Summit on Sustainable Development (2002) Report of the World Summit on Sustainable Development: Johannesburg, South Africa, 26

- August - 4 September 2002. New York: United Nations. On-line at: <http://ods-dds-ny.un.org/doc/UNDOC/GEN/N02/636/93/PDF/N0263693.pdf> (last visited September 2006)
141. Van der Merwe I and Van der Merwe J (1999) *Sustainable Development at the local level: An Introduction to Local Agenda 21 - A South African Version*. Department of Environmental Affairs and Tourism: South Africa.
  142. Veleva V and Ellenbecker M (2001) Indicators of Sustainable Production: Framework and Methodology. *J Cleaner Prod*, 9, 519-49.
  143. Vogt W (1949) *Road to Survival*. London: Victor Gollancz Ltd.
  144. Waage S (2006) Re-considering Product Design: A Practical "road-map" for Integration of Sustainability Issues. *Journal of Cleaner Production*. Pp1-12.
  145. Wackernagel M and Rees W (1996) *Our ecological Footprint: Reducing Human Impact on the Earth*. Philadelphia: New Society Publishers.
  146. Waddock S and S Graves (1997) The Corporate Social Performance – Financial Performance Link. *Strategic Management Journal*, 18, 303-319.
  147. Ward B and Dubos R (1972) *Only one Earth: The Care and Maintenance of a Small Planet*. Middlesex: Penguin Books Ltd.
  148. Willard B (2002) *The Sustainability Advantage: Seven Business Case Benefits of a Triple Bottom Line*. Gabriola Island, BC.: New Society Publishers.
  149. Wilson J, Tyedmers P and Pelot R (2006) Contrasting and Comparing Sustainable Development Indicator Metrics. *Ecological Indicators*. On-line at: <http://www.elsevier.com> (last visited 12 August 2006).
  150. Wilson M (2003) Corporate Sustainability: What is it and where does it come from? *Ivey Business Journal: Improving the Practice of management*. On-line at: [http://www.iveybusinessjournal.com/view\\_article.asp?intArticle\\_ID=405](http://www.iveybusinessjournal.com/view_article.asp?intArticle_ID=405) (last visited 27 November 2006)
  151. Woolworths (2005) *Worldworths Annual Report*. Woolworths.
  152. World Business Council for Sustainable Development (WBCSD) (1997) *Signals of Change: Business Progress Toward Sustainable Development*. Geneva, Switzerland.
  153. World Commission on Environment and Development (WCED) (1987) *Our Common Future*. Oxford: Oxford University Press.
  154. World Economic Forum (WEF) 2002 An Initiative of the Global Leader of Tomorrow Environment Task Force. Annual Meeting 2002. Pilot Environment Performance

Index. Online at: [http://www.ciesin.columbia.edu/indicators/ESI/EPI2002\\_11-FEB02.pdf](http://www.ciesin.columbia.edu/indicators/ESI/EPI2002_11-FEB02.pdf) (last visited November 2006).