



*Assessing Sustainability
from the Corporate
Perspective
-An interdisciplinary approach*

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*SLU, Department of Economics
Degree Thesis in Environmental Science
E-level, 30 ECTS credits*

*Thesis No. 530
Uppsala, 2008*

ISSN 1401-4084

ISRN SLU-EKON-EX-No.530-SE

Assessing Sustainability from the Corporate Perspective
-An interdisciplinary approach

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Box 7013
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ISSN 1401-4084
ISBN SLU-EKON-EX-No.530-SE

Tryck: SLU, Institutionen för ekonomi, Uppsala, 2008

Acknowledgements

The inspiration for this thesis was initially engaged during my internship with the Finland's Ministry of the Environment during the summer 2007. My boss of that time, Sauli Rouhinen, gave me an opportunity to carry out a survey on sustainability assessment tools. With the assistance of him and other colleagues of mine, especially Jarmo Muurman and Annika Lindblom, this project would not have been done. I would also give a special mention to Jyri Seppälä from the Finnish Environment Institute who provided me his kind assistance throughout the project.

Later on, during my studies at the Swedish University of Agricultural Sciences and Uppsala University I came up with an idea to look at these sustainability assessment tools from the corporate perspective. With this topic in my mind I approached Cecilia Mark-Herbert and asked her if she could be my thesis advisor. She kindly agreed to take this task. With her academic knowledge and skills she was able to provide me important insights especially in terms of business management. Most importantly, Cecilia encouraged and inspired me with my writings as well as provided me constructive critique along the way.

Lastly, I would like to thank my beloved girlfriend Jennifer who despite of my 'dark' moments stand beside me all the way.

Helsinki, July 29th, 2008

Jonas Rorarius

Abstract

Today, there is an increasing awareness of problems related to aspects of sustainability in the world. These problems are addressed in various forms, from an economic, environmental and socio-cultural perspective. From a corporate point of view it would be ideal if all of these perspectives were included in assessment that serves as grounds for policies, plans and programs. The existing assessment tools are argued to be inappropriate as they do not cover all of the aspects of sustainability. Thus, there is a need for better sustainability assessment tools to help corporate *ex-ante* decision-making.

This thesis explores sustainability aspects in *ex-ante* assessment tools for assessing sustainability from the corporate perspective. The approach is based on notion that sustainability objectives require interdisciplinary thinking. These different disciplines and their contribution to sustainability objectives serve as a basis in a discourse analysis. The results of these analyses are then compared to selected assessment tools (Cost-Benefit Analysis, Environmental-Impact Assessment, social-Impact Assessment) and to newer sustainability assessment tools (Sustainability Impact Assessment, Integrated Sustainability Assessment), to evaluate to what degree they cover sustainability objectives. Any of these tools could serve as a starting point for a development of a corporate *ex-ante* assessment tool box. Over time, a useful ‘toolbox’ may even become the main stream corporate tool in a standardization process.

Findings show that short-term profit-maximization thinking at the expense of other sustainability aspects is a key problem. None of the existing assessment tools alone adequately include all of the aspects of sustainability in their assessments. Newer sustainability assessment tools are found to better ensure a holistic approach for assessing sustainability. These are, however, not well-developed and they are also rather time consuming as well as resource intensive in practical use.

As each of the discussed assessment tools provided some positive aspects it might be useful to integrate some of the attributes that these tools provide. In general, corporations should consider economic, environmental, socio-cultural, spatial and temporal aspects of sustainability in their assessment processes.

Key terms: sustainable development, assessment tools, *ex-ante*, decision-making, discourses, standardization

Sammanfattning

En allmän samhällelig medvetenhet om hållbarhetsfrågor och problem ökar världen över. Problemen och utmaningarna som är relaterade till hållbarhet kan uppfattas från olika vinklar: i ekonomiska, miljörelaterade och sociokulturella aspekter där varje vinkel i sin tur har vokabulärer, modeller och mål för olika verksamheter. Ur ett företagsperspektiv vore det ideal om alla dessa perspektiv utgjorde grunden för strategisk planering och operativ verksamhet. Existerande verktyg som används med hållbarhetsambitioner idag kritiseras för att de inte täcker hela hållbarhetsbegreppet, är komplicerade att använda och att de just inte ger det operativa stöd företagen önskar i *ex ante* beslutssituationer.

I examensarbetet presenteras ett antal vanliga företags-”verktyg”, utvärderingsmetoder som används som *ex ante* beslutsunderlag (Cost-Benefit Analysis, Environmental-Impact Assessment & social-Impact Assessment). De jämförs med två nya verktyg som är under utveckling (Sustainability Impact Assessment & Integrated Sustainability Assessment). Dessa analyseras med avseende på hur väl de täcker in vedertagna hållbarhetsmål. Av dessa verktyg kan vilket som helst av dem utgöra en startpunkt för en fortsatt standardiseringsprocess, i vilket allt fler företag använder, förväntas använda och till slut avkrävs att använda just det redskapet. Då vill det till att utvecklingen har givit utrymme för öppna jämförelser längs vägen.

Resultaten visar att korta tidsperspektiv med vinstmaximeringsmål utgör en motsats till långsiktiga hållbarhetsmål. Ingen av de redskap som företag idag använder i sina *ex ante* bedömningar inkluderar alla aspekter på hållbarhet. De nyare hållbarhetsredskapen för analys utgör grunder för en lovande utveckling. I skrivande stund är de tyvärr inte utvecklade och anpassade för praktisk användning i företag. De är för tids- och resurskrävande. Var och en av de analyserade redskapen bidrog med värdefull information som är relaterad till hållbarhet. I realiteten är det en fin balansgång för företag att maximera vinst på både lång och kort sikt utan att göra avkall på miljörelaterade, sociala, geografiska och kulturella mål.

Nyckelord: Hållbar utveckling, verktyg, utvärderingsmetod, *ex ante*, beslutsfattande, standardisering, diskurs

Abbreviations

CBA	Cost-Benefit Analysis
CSR	Corporate Social Responsibility
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EU	European Union
EU SDS	EU Sustainable Development Strategy
ISA	Integrated Sustainability Assessment
IPCC	Intergovernmental Panel on Climate Change
LCA	Life-Cycle Analysis
MATISSE	Methods and Tools for Integrated Sustainability Assessment
MCA	Multi-Criteria Analysis
MNC	Multinational corporation
NEPA	National Environmental Policy Act
NPV	Net Present Value
NGO	Non-governmental organization
OECD	Organisation for Economic Co-operation and Development
SAP	Structural adjustment program
SEA	Strategic Environmental Assessment
sIA	social-Impact Assessment
SIA	Sustainability Impact Assessment
SD	Sustainable development
UNCED	United Nations Conference on Environment and Development
UNFCCC	United Nations Framework Convention on Climate Change
WSSD	World Summit on Sustainable Development
WWF	World Wide Fund for Nature

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1 Introduction

This thesis starts by providing background information of the study followed by problem area. These constitute for the aim of the paper which is defined within its own section. Thereafter, a short outline of the paper is provided.

1.1 Background

Today, there is increasingly discussion on environmental, social and economic problems of the world. Examples of these include global climate change, population growth, loss of biodiversity, and social inequalities due to globalization. However, these phenomena are not necessarily new.

Since Rachel Carson's book *Silent Spring* (1963) environmental issues have received more attention on the international level. Separate accidents occurred for multinational corporations (MNCs), such as Bhopal incident in 1984 and Exxon Valdez in 1989, have further brought environmental issues to surface. Economic and energy issues were pushed forward due to the oil crisis in the early 1970s and again later in the same decade. Moreover, during the 1980s, Ronald Reagan's and Margaret Thatcher's neo-liberal policies, namely free trade initiatives such as structural adjustment programs (SAPs) for the developing countries, were heavily criticized by non-governmental organizations (NGOs) and other citizen movements due to their unfavourable outcomes (Thomson, 2004). Socio-economic problems were given a boost by the Club of Rome's report *Limits to Growth* (Meadows *et al.*, 1972). Recently, China's and other emerging market countries poor labour conditions have been brought up in the media.

However, it was not until Brundtland Commission and their final report *Our Common Future* (WCED, 1987), when economic, environmental and social dimensions were put into the same context, and as a consequence was named as 'sustainable development' (SD). Since then, the concept of SD has become increasingly more important for many governments, NGOs, private citizens and even MNCs. Boosts for these can be traced to the United Nations Conference on Environment and Development (UNCED), also known as Rio Summit, in 1992, resulting in the Rio Declaration on Environment and Development and for the action blueprint of SD, known as Agenda 21. Also, the World Summit on Sustainable Development

(WSSD) in Johannesburg in 2002 and more recently the United Nations Framework Convention on Climate Change (UNFCCC) conference in Bali as well as the Nobel Peace Prize received by Al Gore and the Intergovernmental Panel for Climate Change (IPCC) have paved the way for the growing importance of SD.

1.2 Problem

SD, even today, still remains a highly controversial issue. This can be understood due to absence of uniform definition of what is meant by SD or how it should be achieved (Hardi, 2007). Other hindrances stems from uncertainty (Söderbaum, 2000), complexity of ecosystems and human social structures as well as the multi-dimensionality, non-linearity and interconnectedness of different aspects of SD (Proops & Wilkinson, 1999; Dryzek, 2005). Environmental effects of global warming, for example, are not straightforward for many professionals or academics.¹ Moreover, as economic, environmental and social aspects of SD are so complex and overlapping, predicting future impacts of certain policies, plans and programs become difficult (Welford, 1998).

As SD issues have been given increasing attention and publicity, not just by governments but also the private sector and especially multi-national companies have gradually taken sustainability matters into consideration in their decision-making processes. In fact, it has become a very central subject for many (Bell & Morse, 1999). Reasons for this can be seen, for example, from tightened environmental laws imposed by governments (Dobers, 1997) and pressure from conscious consumer behavior (Welford, 1998), which have pushed companies to become more aware of SD. However, actions or corporate social responsibility (CSR) in general, taken by the companies are not always as good as their intentions are on the paper (Luke, 2005; Schwartz, 2004). One of the problems stems from the prevailing market-economy paradigm in which profit-maximization criteria dominates with the expense of other aspects of SD (Rikhardsson & Welford, 1997; Söderbaum, 2000; Gillespie, 2001). In other words, emphasis is laid on consumption and thus increased production. In general, environmental management systems are concentrating merely on biophysical environmental and economic aspects (Vanclay, 2004) and thus overlooking other sustainability aspects.

¹ Intergovernmental Panel on Climate Change (IPCC), for example, states that global warming is 'only' 90 percent sure caused by anthropogenic greenhouse gas emissions

More importantly, implementing SD aspects into decision-making can be difficult due to a large information flow (Alvesson & Willmott, 1996) and lack of explicit tools for evaluating the SD impacts of corporate policies, plans, and programmes.

There already exist various assessment tools for evaluating environmental, economic and social aspects. Traditionally these have been used separately to assess different dimensions of SD. For example, Environmental Impact Assessment (EIA) and Life-Cycle Analysis (LCA) are commonly used to evaluate environmental aspects. Cost-Benefit Analysis (CBA) is widely used for assessing economic aspects whereas Social-Impact Assessment (SIA) can be used for assessing social aspects. Multi-Criteria Analysis (MCA) and Strategic Environmental Assessment (SEA) are examples of integrated assessment tools. However, all of these assessment tools are criticized by many as these do not necessarily encompass all aspects of SD. That is to say they do not consider environmental, social and economic aspects as a whole (see for example Bond *et al.*, 2001). To overcome such problems there have been attempts to develop various methods for better sustainability assessment. Namely, the Sustainability Impact Assessment (SIA) and the Integrated Sustainability Assessment (ISA) are the most prominent of these. Yet, SIA is currently applied only in the international (particularly in the European) or country level, i.e. assessing wider policies and/or strategies, whereas ISA is still in a developing stage. At the corporation level implementation of such sustainability assessment tools are not necessarily widely been in used. Therefore, implementing such assessment tools into a corporate level would better ensure corporations sustainability performance.

1.3 Aim

This study aims at making a comparison of a selected set of different assessment tools in order to see how well they cover the grounds that sustainability encompasses. Ultimately, the paper will provide some suggestions of what should be emphasized in sustainability assessment processes. More particularly, the paper is concentrating on sustainability assessments for policies, plans and programs which are assessed beforehand (*ex-ante*). This is a sort of forecasting tool for predicting long term consequences and particularly possible effects on different aspects of SD. By doing this type of assessment corporations would already have an idea what kind of possible outcomes proposed policies, plans and programs

would have. The basic idea here is that it is easier to change those policies and such before they are taking place than afterwards. Moreover, making a sustainability assessment beforehand it would better ensure that SD dimensions are taken into consideration in the planning process.

In order to do this it is vital to understand what is meant by SD, with the intention that the most important aspects of sustainability will be covered in the assessment process. Hence, the sub-objective is to draw some conclusions of what different disciplines emphasize in SD. As there already are various assessment tools, it could be useful to analyse their functions and methods, by reflecting to SD criteria, in order to see how they could be used to strengthen the actual sustainability assessment processes. Also, by looking at the work (theoretical) done on actual sustainability assessment tools could further support the implementation for the corporate perspective.

Following bullet points summarize the aims of this study, indicating the overall goal at the top and ways of achieving it, followed below. The paper aims at:

- Providing some suggestions of what should be emphasized in sustainability assessment processes

This is going to be carried out by answering the following research questions.

- What do different disciplines stress in SD?
- What are the methods used and aspects covered in popular existing assessment tools?
- What are the methods used and aspects covered in 'newer' sustainability assessment?

1.4 Outline

This paper started with an introduction in which background information and problem identification were provided. The following parts include method which constitutes bases for the rest of the paper. This is followed by the main body in which, first different views of SD are discussed. Existing (selected) assessment tools and newer assessment tools are then considered regarding to SD views. After both of the sections a brief analysis is provided. Thereafter discussion part and lastly some conclusions are drawn.

In order to reach the overall target, this study starts (Chapter 3) by analysing SD and its different aspects. Environmental, economic and social dimensions as well as the whole spectrum of SD are examined from different discipline perspectives. This will include spatial and temporal magnitudes as well. The nature of this study is based on discourse analysis (Gee, 2001; Wodak & Meyer, 2001). Simply, it means that different ‘world views’ are considered in order to get a holistic overall sight of what SD can mean and should deal with. In overall, the idea is to see what parts should be emphasized when assessing sustainability.

Chapter 4 will then concentrate on introducing different, already in use, assessment tools. Here, some definitions, their assessment processes and some impact aspects are looked at. Thereafter, in chapter 5, these selected assessment tools are analysed against SD aspects (as discussed in chapter 3). In Chapter 6, newer sustainability assessment tools are examined similarly as the existing assessment tools. Again, in Chapter 7, some analysis is made in terms of their SD aspect coverage. The purpose of these parts is to see what should be taken into consideration to better ensure that sustainability aspects would be covered.

In Chapter 8, the previous parts are discussed in the context of standardization (Brunsson *et al.*, 2000). More particularly, sustainability aspects from the corporation perspective are looked at. Thereafter, the use of selected (existing) assessment tools and newer sustainability assessment tools are considered from the corporation point of view. Finally, in Chapter 9, conclusions are drawn as well as suggestions for the future studies.

2 Method

In this chapter the method is discussed. First the general approach is showed and explained. This is followed by reasons of choosing disciplines and tools as well as more detailed way of doing the analysis throughout the paper. Theoretical framework is also discussed and finally limitations and critique of the chosen methods are provided.

2.1 General approach

The starting point of this paper is that SD as a term has different meanings and they vary for example across individuals, institutions, cultures and disciplines. There are no generally accepted standards or specific scientific definitions of what SD encompasses. In fact, there are vast numbers of different interpretations of it (Hardi, 2007). Hence, as SD constitute the backbone for this study it is vital to cover it thoroughly. In order to do this and carry out a comprehensive analysis, this study will use an interdisciplinary approach. As a definition (see for example Augsborg, 2006; Davies & Devlin, 2007), interdisciplinary can be understood as combining theories and methods from different disciplines. Moreover, the chosen different disciplines should have a generic topic (i.e. SD) that could strengthen the understanding of the overall problem (i.e. sustainability assessment). In general, interdisciplinary approach is very useful especially when studying complex issues (Augsburg, 2006). Using one or even couple of approaches would greatly limit the understanding of the whole range of complexity which, especially, SD is subject to.

There is, however, no common agreement how to do interdisciplinary research (Robertson *et al.*, 2003). In this study interdisciplinary approach is used by analysing different disciplines and the way how they perceive SD. What aspects of SD are emphasized in each of these disciplines? The research method for this interdisciplinary approach is based on discourse analysis (see for example Gee, 2001; Wodak & Meyer, 2001). This implies understanding phenomenas from a world view perspective. As each of us have different views of the world so do different disciplines (Augsburg, 2006). Thus, analyzing SD by looking at different disciplines would allow getting a bigger picture, a multitude of perspectives. In terms of assessment tools, it is important to know what to evaluate. As this depends of the interpretation of SD (Hardi, 2007), it is vital that this concept is thoroughly and widespreadly

discussed. Also, there is a growing awareness of the need of integrating not just tools but different disciplines in the sustainability assessment process (Draaijers & Verheem, 2007).

2.2 Choosing and using disciplines

Standardization is largely based on the effects of dominant disciplines (Jacobsson, 2000). Others, such as economics (in terms of prevailing market economy paradigm), may have played a greater role. That is why economics was focused. Moreover, classical economics as a discipline has developed over time and new sub branches have risen. Most common of these are neo-classical economics and environmental economics as well as business economics. Newer ones, such as ecological- and institutional economics have emerged mainly due to their criticism towards mainstream (classical-based) economics. Other social sciences were included to provide larger insight of softer values. Political- and socio-sciences were believed to present such views.

Another reason for choosing these disciplines is due to interdisciplinary thinking behind sustainability assessment tools as identified by Rotmans (2006). According to him, there is a growing awareness and need to include various disciplines as building blocks for developing such assessment tools. Human behaviour aspects, for example, should be addressed from micro-economics and sociology perspectives. Similarly, social-cultural dimension should be regarded from social anthropology point of view, institutional dimensions from institutional economics and sociology whereas ecological dimensions should include ecological economics and environmental economics along with ecology.

Discipline discourses of SD included into the analysis consist of mainly social sciences ranging from environmental economics to ecological economics and from sociology to political sciences (see Table 1 for the whole list). Moreover, these disciplines are covered by looking at some key authors in their fields. Two of the chosen scholars (Boulding and Friedman) have passed away but nevertheless their ideas have had a strong influence on others. Most of the chosen authors and their literature covered in this paper were also some of

the key readings during the author's own studies.² Environmental sciences are less represented as most of the scholars already include these aspects (ecological) into their views.

Table 2.1 Disciplines and social science scholars

DISCIPLINE	AUTHOR/S
Economics	
• neo-classical economics	- Boulding, K. (1966) - Friedman, M. (1970)
• environmental economics	- Pearce, D. & Turner, R. (1990) - Pearce, D. & Warford, J. (1993) - Tietenberg, T. (1992)
• business economics	- Elkington, J. (1999) - Epstein, M., J. (2008) - Rikhardsson, P. & Welford, R. (1997) - Welford, R. (1998)
• ecological/institutional economics	- Prugh, T., Costanza, R. & Daly, H. (2000) - Söderbaum, P. (2000)
Social sciences (other than economics)	
• social anthropology	- Thin, N. (2002)
• sociology	- Sachs, W. (1999)
• political sciences	- Dryzek, J. (1997) - Luke, T. (2005) - Paehlke, R. (1999)
• international law	- Gillespie, A. (2001)
• environmental philosophy/ethics	- Attfield, R. (1999)

Economics and other social sciences as seen in the table should be interpreted as the vague distinction of disciplines. Of course there are dissimilarities within a discipline and similarities among disciplines. However, this would still provide a broad overview of different discourses of SD.

Different discourses were then put together (compared and aggregated) into wider concepts and used as a basis for the analysis of existing assessment tools, i.e. how do they cover those SD concepts. In this part assessment tools' processes were also looked at. The next phase was to go over the 'theoretical' work done on sustainability impact assessment tools. Again, they were analysed similarly as selected assessment tools, i.e. which aspects SD do they cover and what are their characters of processes. By identifying pros and cons of different assessment

² The author has pursued a Master Degree in Ecological Economics at the Mälardalen University (Västerås, Sweden) during 2006-2007. Currently he is studying a Msc. Degree in Sustainable Development with the Swedish University of Agricultural Sciences and Uppsala University (Uppsala, Sweden).

tools it might be possible to combine some of their characters in order to strengthen the actual sustainable assessment tool. The table shown below (Table 2.2) was used as the starting point of the analysis. This was because the three aspects (economic, environmental and social) is the most well-known framework of SD, as identified in the Brundtland Report (WCED, 1987) and reaffirmed in Agenda 21 (www, UN, 2004). Temporal and spatial aspects were included to provide intra- and intergenerational dimensions as identified by the Brundtland Report. This list was updated along the way.

Table 2.2 Assessment tools and dimensions of Sustainable Development

ASPECTS & CONCEPTS OF SUSTAINABLE DEVELOPMENT	EXISTING (SELECTED) ASSESSMENT TOOLS (CBA, EIA, sIA)	NEWER SUSTAINABILITY ASSESSMENT TOOLS (SIA, ISA)
Economic		
Environmental		
Social		
Temporal and Spatial		

In the first column only the general SD dimensions are listed. As the study went along this table build up. The other columns were similarly updated along the way. They showed which aspects were taking into consideration in a specific tool.

2.3 Choosing and using assessment tools

There are several assessment tools for evaluating different aspects of sustainability. However, in general they are based on neo-classical economic thinking (Rotmans, 2006) and thus do not necessarily address the whole concept of SD. This is the reason why theoretical work on sustainability assessment tools is used for further analysis. The author has previously³ tried to categorize some of existing assessment tools and newer sustainability assessment tools. This paper is used as the starting point for choosing assessment tools. Table 2.3 below shows the whole list.

³ The author has conducted a study on assessment tools while doing his internship for the Finland's Ministry of the Environment during the summer 2007. See full report Rorarius, 2007. Available online <http://www.ymparisto.fi/download.asp?contentid=73204&lan=en>

Table 2.3 Different assessment tools and their dimensions

(modified from Rorarius, 2007:12)

D I M E N S I O N	ASSESSMENT TOOLS			
	<i>Indicators/Indices</i>	<i>Product-Related Assessment</i>	<i>Project-Related Assessment</i>	<i>Sector and Country-Related Assessment</i>
<i>Environmental</i>	Environmental Pressure Indicators (EPIs) Ecological Footprint (EF) Environmental Sustainability Index (ESI)	Life Cycle Assessment (LCA) Material Input per Service (MIPS) Unit Substance Flow Analysis (SFA)	Environmental impact assessment (EIA) Environmental Risk Analysis (ERA)	Environmental Extended Input-Output (EEIO) Analysis Strategic Environmental Assessment (SEA)
<i>Economic</i>	Gross National Production (GNP)	Life Cycle Costing (LCC)	Cost-Benefit Analysis (CBA) Full Cost Accounting (FCA)	Economy-Wide Material Flow Analysis (EW-MFA) Economic Input-Output (EIO) analysis
<i>Social</i>	Human Development Index (HDI)		Social Impact Assessment (sIA)	Social Input-Output (SIO) analysis
<i>Sustainable Development</i> <i>(all three dimensions considered)</i>	Sustainable Development Indicators (SDI)			Sustainability Impact Assessment (SI A) Integrated Sustainability Assessment (IS A)

When analyzing already in use assessment tools only project-related (CBA, EIA and sIA) assessment tools were considered. This is because they are all well-established (at least the two former ones) and represent the three aspects of SD (Vanclay, 2004). Product-related assessment tools, such as Life-Cycle Analysis (LCA), were not included in the study as these are more straightforward scientific assessment tools, do not involve stakeholder participation and are thus value judgement free. Sector and country-related assessment tools, such as Strategic Environmental Assessment (SEA), were excluded due to a limited corporate use. Moreover, different kind of indicators and indices, such as Ecological Footprint (EF), are also excluded since they are not *ex-ante* assessment tools. They are, however, important in the follow-up assessment process.

From the newer sustainability assessment tools SIA is most widely studied. This, however, does not mean that there is a uniform standard of using SIA. Instead, different EU countries have developed different variations of it. ISA, on the other hand, is largely based on European Commission funded study called *Methods and Tools for Integrated Sustainability Assessment* (MATISSE)⁴. Even though the work on these sustainability assessment tools is targeted to government policy level, they were included in the study as their characters were believed to provide valuable insights for corporate level sustainability assessments. Also, as MNCs are operating in many places and cultures; influencing various people, communities and even governments they could in some level refer to ‘countries’.

2.4 A theoretical framework

As discussed above the first aim of this study was to understand what SD encompasses. Therefore, discourse analysis was used for finding out what various disciplines stressed in their way of seeing SD. By comparing these different world views (discourses) a more holistic view of SD was drawn. These aspects were then compared to chosen assessment tools by pointing out what of these aspects were actually included in the assessment.

It was also mentioned that neo-classical economics as a discipline was the prevailing paradigm behind most popular/chosen tools (CBA, EIA). Thus, standardization, as discussed in *A World of Standards* by Brunsson *et al.* (2000), was used to analyze reasons for this. Standardization is discussed more in detail in chapter 8.

According to Brunsson (2000:22) standardization is highly rationalized as it is “usually defended by reference to their [its] allegedly desirable consequences, rather than by reference to tradition and long-established custom”. Moreover, standards are influenced by the interest (values, ambitions) of those people who are observing them. After all they are voluntary acts. Standardization is also linked with science and some disciplines might have played a more influential role in standardization (Jacobsson, 2000). The book also claims that the need for standardization has become more important in the world of globalization. This can be understood due to lack of formal organizations at the global level and lack of common norms due to multitude of cultures. In fact, “standards generate a strong element of global order in

⁴ For more information see, <http://www.matisse-project.net/projectcomm/>

the modern world” (Brunsson, 2000:1). However, number of global organizations, especially NGOs such as Amnesty International and World Wide Fund for Nature (WWF) share similar values. Such organizations have developed standards for example regarding sustainable use of palm oil but it has not necessarily come standardized among relevant stakeholders. Reasons for these can be seen profit-maximization thinking which rules out other aspects.

2.5 Delimitations and scope

The research was conducted by using mainly secondary sources. These included mostly academic journals and books as well as some official documents from various organizations, which were dealing with assessment tools and sustainability matters. Hence, throughout the paper a rather theoretical perspective was taken. This is also the limiting factor of the paper as practical implications were not tested in real life situations. When considering the results, one should keep in mind that this study mainly aimed to review and analyze theoretical aspects of SD and different assessment tools.

The chosen scholars did not always discuss SD in general but rather concentrated on one or two of the aspects. This clearly limits the overall picture of SD and as a consequence it affects the perspective for this paper. The chosen literatures, in general, were writings from top researcher and academics in their relevant fields, including the authors related to different assessment tools. However, most of them were Western scholars. This greatly limited non-western perspectives of SD and especially cultural aspects. Also environmental scientists were excluded and thus hindered especially ecological aspects. On the other hand, as said above, most of the scholars included environmental/ecological aspects in their writings. The role of technology is not particularly discussed. As this aspect is very important in shaping future developments, excluding it hindered the overall SD discussion.

In terms of chosen existing assessment tools only three of them (CBA, EIA, sIA) were considered. These were also looked at in general level. There are a number of other tools and even different variations of the three chosen assessment tools. Nevertheless, these tools are widely used (especially the two former ones) and it is believed that they cover the three aspects of SD; economic, environmental, socio-cultural (Vanclay, 2004). The newer assessment tools (SIA, ISA) are aimed and designed for government level and not corporation level. Hence, their usefulness to corporations can be questioned. Yet, as it was mentioned

above, they might still provide some important insights for better sustainability assessment even at the corporation level.

3. Interpretations of sustainable development

Sustainable development has been widely discussed among academics. What seems to be evident is that there is no universal agreement what is meant by SD. As there are different approaches seeing the world (Evernden, 1993, 2004), there are several interpretations, or at least, different emphasizes laid on defining SD and its aspects. Hence, the purpose of this chapter is to provide an overview on what different disciplines highlight in their discussions of sustainability.

The chapter starts by providing general views of SD. Thereafter economic, environmental and social aspects are considered separately. These are followed by temporal and spatial dimensions of sustainability. Finally this part will then draw together similarities in these different aspects indicating what should be stressed when dealing with sustainability issues. These are then used as foundations when discussing on assessing sustainability (discussed in later chapters).

3.1 The concept of sustainable development

The concept of SD was first time internationally propose and recognized by the *Brundtland Report* (WCED, 1987). Even today it probably provides the most well-known definition of SD. It is defined as “Development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (*Ibid.*:43). Broadly speaking SD means promoting economic growth without compromising social or ecological balance (e.g. endangering the natural systems that support life on earth) and by allowing future generations to have the same resources for their usage as the ones have now. How to achieve this, suggested by the report, is by reviving and changing the quality of growth (less material- and energy intensive industry) and conserving natural resources (e.g. efficient and sufficient use of them). Above all what is needed is reorienting technological innovation and management (e.g. to meet socio-economic and environmental needs) as well as merging environment and economics into decision-making (e.g. changing legal, political and institutional arrangements for serving SD aspects).

This interpretation can be traced to Boulding's (1966) idea of 'spaceship earth'⁵. In his view the planet restricts human activity by its absolute borders as resources are finite and human actions have the capacity to weaken the functionality of the biosphere.

Most of the other literature seems to perceive challenges in SD. Welford (1998), for example states that there is a trade-off between economic growth and environmental quality. Paehlke (1999) similarly stresses this view but includes social aspects as well. Hence, all of the three aspects of sustainability are interconnected and conflicts arise when only concentrating on one of them. For him, what is then needed for pursuing SD is a proper policy which seeks to balance economic, social and environmental sustainability, while stressing the latter. Welford (1998) argues in the same way but stresses that it is possible maintain economic growth and sustainable environment by adopting sustainable strategies. On a corporate level, ways of doing this are by integrating environmental aspects into companies' decision-making processes. This could, for example, reduce cost by becoming more efficient and open market opportunities by meeting the demands of conscious consumers.

Luke (2005:229) argues that "sustainable development fails on its own terms, because it is deeply embedded in the logics of normalization found in corporate commodity circulation, technological diffusion and global governance organization". He continues claiming that the language used by actors around sustainable development is merely to gain greater symbolic power. Moreover, this concept remains largely on policy rhetoric and thus undermining actual actions toward achieving sustainable development. In other words, governments and corporations are subjects to neo-liberal market paradigm, in which global governance is influenced by this and pushing it forward. For Luke, sustainable development has become an economic calculation and thus undermining sustainability and development as it appears in the policy rhetoric.

In fact, as Rikhardsson and Welford (1997) point out, in reality corporations mainly seem to interpret sustainability issues as simple, well-structured, piecemeal problems that can be easily handled by traditional management practices. These include, for example, popular environmental management systems (EMS) and standards such as ISO 14001. Similarly, the increasingly used eco-efficiency concept stresses on efficient resource use and thus presents

⁵ Discussed in more detail under the section of 3.3, economic aspects of sustainability

some business-as-usual concepts such as use of best-available-technology (BAT). According to them, all these approaches are problematic as they disregard the fact that environmental problems are complex and multi-faceted. They originate from and strengthen the positivist paradigm for viewing environmental action. The concept essentially sees the problems as, for example, objective limitations of resources, which can be solved rationally and scientifically through improved technologies of dealing with the physical world. At the end, EMS and standards merely reflect the attempt to legitimating the way businesses handle sustainability issues as argued by Luke (2005).

Such positivist paradigm could be challenged by interpretivism as identified by Rikhardsson and Welford (1997). This paradigm emphasizes the importance of individuals and their values and calls for reorganizing businesses to truly reflect sustainability and the demands of all social groups. Söderbaum (2000) has widely discussed these issues in terms of ideological orientation. What he puts forward is that each of us has different roles, motives and interest. These factors (i.e. ideological orientation) are decisive for individuals' decision-making and in general how they see and understand things. In terms of decision-making in corporation, Söderbaum stresses dialogue with all the stakeholders. His argument is based on the fact that environmental problems are complex and multidimensional and thus subject to uncertainty. Hence, no one can know all the answers and thus dialogue is needed. Experts (e.g. scientists) have role to play in decision-making but they should also realize their limits. For example, local communities might have a better understanding of the sustainability issues that they are facing than environmental managers of the companies. Söderbaum continues saying that "all are part of social learning and control system where transparency and accountability are positive features" (*Ibid.*:8) By this he means that dialogue could contribute positive outcomes and are indeed needed when dealing with sustainability issues.

Friedman (1970) argued that businesses' only social responsibility is to increase their profits as long as they operate accordingly under the basic rules of the society and in free and open markets. His view is based on the argument that acting socially responsible ways is always with the expense of something else. Moreover, corporations are seen as artificial persons and as only people can have responsibilities this does not imply for companies. On the other hand, Söderbaum (2000) claims that this kind of 'profit maximizing firm' undermines the power balance between different actor categories (stakeholders) within the organization and its field. Instead a firm and other stakeholders are regarded as a collectivity of individuals in ways that

ideological values of individuals may be different than the collective ideological view of the company (e.g. mission statement, business concept). These different views can cause tension between different actor roles and categories. Hence, Söderbaum states that corporations do have responsibility to take into consideration other than only non-market values.

Elkington (1999) also argues that business should not just be concerned of making economic profit but operate more responsible in ways that environmental and social issues are taken into consideration. In general, the so-called 'triple bottom line' (TBL) concept, originated by him, has become common among business to describe sustainable development. For Elkington, TBL includes economic prosperity, environmental quality and social justice. Other business literature seems to agree on this view. Epstein (2007) for example states that corporations have to take into consideration social and environmental issues if long-term economic growth should be thrived for. Corporate long-run profitability can be maintained or even increased if negative economic, environmental and social impacts are reduced, for example through higher production yields and improved product quality. Epstein also points out that, objectives of multiple stakeholders should be satisfied.

3.2 Economic aspects of sustainability

Several authors have studied the issue of sustainability and its relation to economics. For Pearce and Warford (1993) environment can not be separated from economic growth. As their starting point is that “the world economy is inextricably linked to the environment because societies must extract, process, and consume natural resource” (*Ibid.*:3). Moreover, due to laws of thermodynamics all resources will end up as waste. That is not, however, to say that economic growth can not be maintained. In fact, as long as resources are used efficiently (conserving energy and materials) environmental impacts due to economic activities can be mitigated.

Gillespie (2001) argues that the ultimate problem of pursuing sustainable development and, in general, development, lies in the current economic structure. He bases his argument on the historical assumptions of development. For example, since the Enlightenment anthropocentrism, technology and industrialization has become the center of development achieving development. These Western views were generally thriving for physical well-being.

What Gillespie argues is that focusing on singular factors (economic growth) and mimicking process of the West hinders the true 'overall' development. Thus, there is need to question the conventional paradigm of development.

Boulding (1966) argued similarly, stating that the problem of achieving sustainable development arises from our economic principles. He called this as the open economy or the 'cowboy economy' in which the world is seen with unlimited resources and space. In this neoclassical economics view consumption and production is the key for development. Boulding saw this kind of growth with the expense of nature as the ultimate problem of not achieving sustainability in the long-run. In other words, living in the present and not considering tomorrow would threaten future generations' ability of enjoying development. His suggestion to avoid this pattern was to change economic principles to a more "closed earth view". In this view, which Boulding called as 'spaceman economy', earth has its boundaries and thus natural resources are understood to be limited. What is then needed is that consumption and production needs to be minimized in order to maintain development in the future.

Söderbaum (2000) continues on Boulding's view stating that the present economic thinking is the main flaw of current situation. He emphasizes the ideological orientation (as seen above) meaning that neo-classical economics leave a little room for environmental and social problems. These are merely seen as a market failures and thus as external costs which could be solved by internalizing the costs.

Prugh *et al* (2000) also criticize current economic structure (neo-liberalism) of the world but do not come up with real alternatives. However, they do suggest, for example, that economy should be reconstructed in such ways that it would encourage people to behave a more sustainable way. Examples of this include taxing consumption and resources rather than income. In general, economy should become better rather than bigger and that it should improve the human well-being.

From the corporate perspective the ultimate problem of sustainability, according to Welford (1998), stems from short-term profit-maximizing view. More particularly, it is the problem of free riding, i.e. taking more than your fair share would be. This can be related to 'tragedy of commons' view. This idea, coined by Hardins (1968), in principle arises when we are dealing

with things that we do not particularly own, such as fresh air and clean lakes. Moreover, as these are open for all of us, we tend to think that it is not our responsibility to take care of them and thus we do not take any initiative to make an action. However, as Welford (1998) points out, becoming more sustainable could also bring competitive advantages for corporations. Meeting the demands of environmentally and socially aware customers could allow exploiting new market niches. In more practical terms corporations should develop substitutes for non-renewable resources and innovations which would reduce energy and waste more efficiently.

On the other hand, as Luke (2005) puts it, public agenda serves the interest of markets and thus big corporations. He bases his argument on neo-classical economic assumption of profit maximization. Hence, corporations are seeking profits and if 'green' sells then it can be called a development strategy. In Luke's terms this undermines the whole idea of sustainability or development as it does not question the consumption pattern. The bottom line remains as economic growth is the main principle and markets the reason for sustainability. Various policies are just manipulated in order to serve these ends.

For Sachs (1999), Western culture, especially in economic point of view, causes greater damage than good. He points out, for example, that people are subjects to scarcity, in ways that they always possess less than they do, and thus they need more to buy and consume. Moreover, such development patterns, in terms of growth, would be beneficial mostly just for developed countries as they are the ones who produces and sells and thus collecting the profits. Less developed countries would be merely substances for market factors. In fact, as Paehlke's (1999) states, economic growth is not essential for sustainable development. On the other hand, he also points out that it does not always result in net environmental damage either.

Nevertheless, Elkington (1999) argues that corporations should consider not just physical and financial capital but also human capital. In the longer run these should be complemented with natural capital and social capital. In simple terms, according to him, such externalities should be included in costs.

3.3 Environmental aspects of sustainability

Environmental aspects are probably the most widely discussed dimension of SD and perhaps even most agreed upon. According to Prugh *et al.* (2000) SD as a definition should at least stress the minimum consumption of natural resources. Because global ecosystem provides resources (e.g. food, fuel), performs ecological services (e.g. climate, water regulation) and absorbs wastes, which human economy cannot do itself, sustainability has minimum technical requirements. In their view these include using resources cautiously, respecting ecological services and cherish the waste-absorption capacity. In this sense it can be said that environmental aspects are the main concern in SD. Hence, in order to achieve sustainable development, one should cherish global ecosystem as it is priceless for human life.

Söderbaum (2000) emphasizes uncertainty due to non-linearity and interdependence of ecosystems. For him some natural functions are indispensable, for example clean water, for humans. In fact, in his view, sustainability could be understood in terms of non-degradation of human environment and its ecosystems as well as natural resources, i.e. maintaining ecological diversity.

Paehlke (1999) also stresses the importance of the environmental aspects of sustainability. For him environmental sustainability, in principle, should regard ecology and biodiversity in terms of habitat protection. Also it should consider air and water quality in ways of pollution abatement and prevention. Resource availability/sustainability (preservation, conservation and management of renewable –and non renewable resources) is the third important aspect of environmental sustainability for Paehlke.

Neo-classical economist such as Pearce and Turner (1990) regard environmental problem as market failures such as external costs and common goods. In fact, these economists emphasize the concept of optimal pollution in which cost and benefits of an action can be balanced. In such cases that would be the sustainable solution. Generally speaking, Pearce and Warford (1993:44) claim that “natural environments serve three major economic functions: they supply direct utility to individuals, they supply inputs to the economic process, and they supply services that support life”. These are relevant for the interpretations of SD.

However, as Elkington (1999) states, corporations should understand that natural capital is not just the sum of trees in the forest. Instead what corporations should take into account is the view of nature in a broader context, as an ecosystem. What are companies' impacts, for example to regulation of water and greenhouse gases as well as flora and fauna? He continues saying that natural capital should be seen as two forms. It can be seen as critical natural capital, which is essential for maintaining life and ecosystem integrity. The other form in which natural capital can be seen is renewable, replaceable or substitutable. This is something that is manageable such as using wind power instead of fossil fuels.

3.4 Social aspects of sustainability

Social aspects, and especially cultural issues, are probably the less discussed dimension of SD, at least among economists. Some, however, consider them very important. Thin (2002), for example, argues that too much of the sustainable development rhetoric is concentrated on economic and environmental aspects. Social aspects, in terms of social development, have been widely ignored or at least undermined in a sense that they are not well defined. The reason for this can be seen due to lack of common element or logic. Social development can not provide clear guidelines, it merely confuses people. Therefore, 'society' needs to be 'relinked' with the concept of society. By this Thin offers family to describe society. They both have institutions (family), relationships (father-son), values (father figure) and attitudes (whether to eat together or not). In this sense societies are differently structured and thus have different relationships among the people (king-compliant). Social aspects matter as they have different cultural values and attitudes (based on e.g. religion). Each society is unique as they are intrinsically different. Hence, sustainable development should focus on equity and human development. According to Thin, one (society) has to define what these are in order to analyze and understand what the desirable sustainable development is.

For Prugh *et al.* (2000), also, cultural and political aspects are the most important dimensions of sustainability. They argue that environment can be the cause for SD but then social aspects are the means for it. For them, engagement, multi-stakeholder dialogue, participation are all key words for bringing sustainability. Moreover, strong democracy is the way for pursuing it. That is because uncertainty and complexity prevails, due to dynamic ecosystems, and thus a single individual or even several would have not all the answers. Also, different cultures

(even individuals) see 'needs' differently. Hence, to pursue sustainability cannot single handedly decided by someone.

Similarly, as Dryzek (1997) puts it, democracy is believed to promote ecological rationality than do harm. In his words, "the more political arrangements are pushed in a democratic direction, the more can environmental justice in particular and ecological values in general expect to benefit" (*Ibid.*: 267). For Prugh *et al.* (2000) SD is some sort of a living organism which will be living and shaping in time. In this sense, socio-political aspects are very important. The question remains, how to get people more involved? As they themselves point out, people have become more ignorant for decision-making. On the other hand, reasons to this can be traced to representative democracy, which allows people to hand out power for the others and thus shift responsibility. In their view, even the local community participation seems nowadays to be less and less important. People simply do not have time. One way could be reducing work time but how many would be willing to do that if their income would be also reduced? Söderbaum (2000) shares the view that socio-cultural diversity is vital, as traditions, customs and wealth of knowledge can be seen as important values and thus resources.

From the company perspective the concept of CSR has become common concept for corporation to deal with socio-cultural issues (including environmental and economic). According to Welford (1998) this should include workers to be treated as integral and valuable part of the corporation and not just as a resource that can be hired and then fired if external market conditions change. This is closely related to Söderbaum's (2000) view in which organizations should be regarded as a collectivity of individuals. Corporations then are seen as polycentric, in ways that individuals' ideological orientation regarding to his/her work place may be different than the collective ideological orientation of the company (e.g. mission statement, business concept). Individuals with different ideological values, therefore, can lead to various actor categories (with same ideological views) exerting power to influence the others to change. This instead can cause tension within the organization and/or its field.

Similarly, as Elkington (1999) points out, companies should take in to account wider political, social and ethical issues. By these he refers to social capital, stating that with the higher level of trust and other forms of social capital corporations are more likely to be sustainable. This depends of corporations' levels and equity of investments in human capital that they do.

3.5 Temporal and spatial dimensions of sustainability

Another important aspect of SD, as stated in the Brundtland Report (1987), is equity among current and future generations. In other words, SD should consider both intra- and intergenerations, meaning that present ‘development’ must take into account present peoples’ needs as well as those of the future. All this should be ‘equally’ share cross the world now and in the future.

For Pearce and Warford (1993) intragenerational equity means maintaining natural resources as it is seen as the agent for “achieving fairness within a generation, that is, achieving justice for the socially disadvantaged both within a country and between countries at a given point in time (*Ibid.*:45). In terms of intergenerational equity, they portray SD as, “development that secures increases in the welfare of the current generation provided that welfare in the future does not decrease” (*Ibid.*:49).

Attfield (1999) argues that there is no uniform development path for achieving SD. He refers to heterogeneity of the world. Hence, ‘consequentialist ethic’, as he calls this, would allow unique developmental patterns which would be best suited to different cultural and historical situations. However, at the same time basic needs should be recognized. Dryzek (1997) argues similarly, stating that rather than having a single blueprint for ideal ecological democracy or democracy in general, we should allow room for experiments in democratic societies. In other words, democracy, according to him, is an open-ended project, i.e. the development of democracy would determine democracy itself.

In practical terms, as Elkington (1999) suggests, corporation should deal with time by building up scenarios rather than plans, having a strategy rather than tactics. He does not however precisely say what this is. Instead, companies should be built to last indicating that intergenerational thinking should be included. Similarly, as Tietenberg (1992) points out, allocation of benefits needs to be shared dynamically and efficiently between generations.

3.6 The revised concept of sustainable development

In the light of above literature analysis it becomes rather evident that there are no specific common standards of what SD encompasses. There are, however, similar concepts that these different authors emphasize. The following table (Table 3.1) summarizes these different aspects and the authors referring to these. This table is further build on World Business Council for Sustainable Development (WBCSD)⁶ common agreements (see appendix 1).

Table 3.1 Emphasized aspects and concepts with respected authors

ASPECTS & CONCEPTS OF SUSTAINABLE DEVELOPMENT	Author
Economic	
-long-term growth	Elkington (1999), Luke (2005), WBCSD
-resource availability	Boulding (1966), Elkington (1999), Paehlke (1999), Pearce & Warford (1993)
-efficiency/sufficiency	Epstein (2008), Pearce & Warford (1993), Prugh <i>et al.</i> (2000), WBCSD, Welford (1998)
-minimum consumption	Luke (2005), Prugh <i>et al.</i> (2000)
Environmental	
-ecological diversity and prevention	Elkington (1999), Paehlke (1999), Söderbaum (2000), WBCSD
-maintaining ecosystems	Elkington (1999), Paehlke (1999), WBCSD
Socio-cultural	
-socio-cultural diversity	Gillespie (2001), Söderbaum (2000),
-multi-stakeholder approach/dialogue	Dryzek (1997), Epstein (2008), Prugh <i>et al.</i> (2000), Rikharddson & Welford (1997), Söderbaum (2000), WBCSD
-ideological and cultural orientation	Attfield (1999), Prugh <i>et al.</i> (2000), Söderbaum (2000), WBCSD, Welford (1998)
-justice, equity and transparency	Elkington (1999), Pearce & Warford (1993), Söderbaum (2000), Thin (2002)
-human well-being	Attfield (1999), Elkington (1999), Prugh <i>et al.</i> (2000), Thin (2002)
Temporal and Spatial	
-intergenerational thinking	Boulding (1966), Elkington (1999), Epstein (2008), Pearce & Warford (1993)
-intragenerational thinking	Pearce & Warford (1993), Tietenberg (1992)
-continuing process	Dryzek (1997), Thin (2002)

⁶ WBCSD is a business leader-led (CEO), global association of about 200 companies dealing exclusively with business and SD

In economic and other social sciences disciplines strong arguments were laid against current economic paradigm (neo-classical economics) and profit maximising thinking. This could be also understood as standard in the current world of affairs. More particularly, the reason for these is due to ignoring non-market values. However, as corporations should make profit for their shareholders, profit maximizing can not be ignored. Instead, short-term thinking should be changed to long-term profit maximizing. In this way corporations would still be able to aim for economic profits but at the same time make a true commitment for their business activities. Such a long-term commitment can also better guarantee that other sustainability aspects are more suitably covered.

Other economic aspects stressed were regarding natural resources as finite. Therefore, preserving resource availability is important. This can be related to long-term profit maximizing as well. Consider, for example, oil reserves in the USA. Production was so intensive that the oil peak followed relatively quickly after the first discovery of oil. More importantly, activities taken by corporation should be targeted at least efficiency and preferably sufficiency. In this sense minimum consumption becomes a vital aspect.

Regarding to environmental aspects, ecosystems were considered to be complex and multi-faceted. Thus, minimum impact on the environment should be prioritised by the corporations. Considering, for example, the Bhopal incident in India, the environment and people living there are still affected of the pollution.⁷ Maintaining ecological diversity and availability should be also emphasized. In general, corporation should protect ecosystems and their functions.

In turn social aspects were widely emphasized in both disciplines. In general, societies were also viewed as complex and multi-layered as was the argument in respect to environmental aspects. Therefore, social and cultural aspects should be considered by the corporations. These could include workers and local communities' religion-related customs as well as cultural differences in general. Also individuals and their preferences and values were understood to be different from one another. Hence, corporation should have a multi-stakeholder approach. In this sense, dialogue among respected stakeholders should be

⁷ for more information see The Bhopal Medical Appeal & Sambhavna Trust,
<http://www.bhopal.org/whathappened.html>

emphasized. At the same time issues regarding to justice and equity should be given priority. In general, corporation should be transparent in every activity they do and ensure that human well-being of every stakeholder is prioritized.

Finally, corporations should consider not just intra-generational aspect but also inter-generational dimensions. This is especially important with MNCs that are operating all around the world. As they might be powerful actors, exercising strong influence on various governments and local communities, it is important that actions taken by them are not solely selfish. After all, many people and ecosystems are affected by such MNCs here and now as well as in the future. In this sense, profit maximising should not be limited to short-term thinking nor should it be with the expense of others sustainability aspects. That is because SD is understood as a continuing process which would shape along the way.

In overall, the division of the three aspects (economic, environmental and social) with temporal and spatial dimensions should be considered as a whole. This is because there are trade-offs (see e.g. Welford, 1998; Paehlke, 1999) between these aspects. Hence, concentrating on one or two of the aspects would have an impact on the other.

4 Selected assessment tools

In this chapter three of the existing assessment tools are considered. These are Cost-Benefit Analysis (CBA), Environmental-Impact Assessment (EIA) and social-Impact Assessment (sIA). Each of them is looked separately in terms of their assessment processes and possible impact aspect concerned in the assessment.

4.1 Cost-Benefit Analysis

Cost-Benefit Analysis (CBA) has a long history (it dates back to late 19th century) and is nowadays well-established (Pearce, 1998) among countries (policy evaluations) and corporation (investment assessments). It can be broadly defined as a “policy assessment method that quantifies in monetary terms the value of all policy consequences to all members of society” (Boardman *et al.*, 2001:2). More precisely, it is an economic tool that can be used for ex-ante evaluations for public or private investment proposals (Ness *et al.*, 2007). CBA is basically based on willingness-to-pay and opportunity-cost concepts in which costs and benefits of an impact is valued in monetary terms. That is to say, “as long as analysts value all impacts in terms of willingness-to-pay and all required inputs in terms of opportunity costs, then the sign of the net benefits indicates whether or not it would be possible to compensate those who bear costs sufficiently so that no one is made worse off” (Boardman *et al.*, 2000:29). CBA can be said to be rooted on neo-classical economics thinking and especially efficiency (Pearce, 1998). Table 4.1 below provides basic outline of how to carry out a CBA.

Table 4.1 Major steps in CBA

(Boardman *et al.*, 2001:7)

1. Specify the set of alternative projects.
2. Decide whose benefits and costs count (standing).
3. Catalogue the impacts and select measurement indicators (units).
4. Predict the impacts quantitatively over the life of the project.
5. Monetize (attach dollar values to) all impacts.
6. Discount benefits and costs to obtain present values.
7. Compute the net present value (NPV) of each alternative.
8. Perform sensitivity analysis.
9. Make a recommendation based on the NPV and sensitivity analysis.

The first stage (1) is rather obvious as the analyst should specify the set of alternative projects. Normally the number of possible alternatives is big which brings difficulties already at this stage. The second stage (2) involves deciding whose costs and benefits are counted. Moreover, this could be at local, national and/or global level. Next (3), one should list the physical impacts of the alternatives as costs and benefits and specify the impacts' (inputs and outputs) measurement units. This does not include impacts other than those which affect the utility of individuals at stake.

The fourth stage (4) involves quantifying all impacts for each alternative under the period of the project. Predicting these impacts becomes difficult especially if projects have long time horizons or different variables possess high complexity. Next (5), impacts should be monetized in a sense that monetary value is given to impacts. This is measured in terms of willingness to pay. If there is nobody willing to pay for some impact, then that would have a zero value. Monetization (6) also involves aggregating the costs and benefits that would occur in different years. Normally, this would mean that future costs and benefits are discounted relative to present costs and benefits with the purpose of getting their present values. The reason can be seen due to people's tendency to consume now rather than later. Also, consuming now implies lesser opportunity to consume in the future.

The seventh stage (7) is to compute the net present value (NPV) of each alternative. This, NPV, implies the difference between the present value of the costs and the present value of the benefits. Thus, the alternative with the highest NPV equals to the largest present value of the net social benefits. NPV criterion basically results in more efficient allocation of resource. It does not mean, however, that allocation of the resources is the most efficient way. This leads to performing sensitivity analysis (8). As there might be uncertainties regarding to predicted impacts and the suitable monetary valuation, sensitivity analysis tries to overcome such problems by trying to find which is the most robust. Finally (9) the results should be considered as recommendations rather than decisions based on the NPV and sensitivity analysis.

Some possible aspects considered in CBA can be seen in Table 4.2 below. This is an example of a highway project in which introducing tolls were compared with no tolls situation.

Table 4.2 CBA in the highway project and relevant aspects

(modified from Boardman *et al.*, 1993:537)

Project benefits: -time and operating cost savings, terminal value of highway, safety benefits (lives), alternative routes benefits, toll revenues, new users Project cost: -construction, maintenance, toll collection, toll booth construction

As seen from the table above, aspects considered are related to possible benefits and costs. Moreover, these can be easily measure and consider in monetary terms. Note that no specific environmental or social aspects are included.

4.2 Environmental-Impact Assessment

Environmental-Impact Assessment (EIA) can be defined as “a process for taking account of the potential environmental consequences of proposed action during the planning, design, decision-making and implementation stages of that action” (Morrison-Saunders & Arts, 2004:1). Ultimately EIA’s objective is to provide decion-makers an indication of the possible consequences of their actions. It has been used already more than 30 years. In fact, in the United States the National Environmental Policy Act (NEPA) of 1969 established the EIA process. Since then several countries and corporations have implemented EIA procedures. Table 4.3 below outlines general process of doing EIA.

Table 4.3 Generic steps in the EIA process

(after Sadler, 1996 cited in Morrison-Saunders & Arts, 2004:2)

PRELIMINARY ASSESSMENT 1. Screening 2. Scoping
DETAILED ASSESSMENT 3. Impact analysis 4. Mitigation 5. Reporting 6. EIS review 7. Decision-making
FOLLOW-UP 8. Monitoring 9. Audit/evaluation 10. Management

Preliminary assessment consists of two stages. The first (1) is screening in which a proposal is to be determined whether it is subject to EIA and at what level. This is followed by scoping (2) which tries to identify the impacts and issues that are expected to be important for EIA.

Detailed assessment starts by impact analysis (3). The purpose of this is to identify and forecast especially the probable environmental impacts but also socio-economic effects of the planned proposal. Next, is the mitigation (4) which involves setting up the measures that are essential for avoiding, minimizing or counterbalancing predicted undesirable impacts. Also these should be incorporated into an environmental management system or plan if applicable. Thereafter, is the reporting (5) stage. It should consist of documenting clear and neutral impacts of the proposal, aimed mitigation measures and the significance of impacts as well as the worries of the public and other relevant stakeholders affected by the proposal. This is followed by reviewing (6) Environmental Impact Statement (EIS). Basically the purpose is to conclude if the report provides a reasonable assessment of the proposal and that it encloses required information for the decision-making. The actual decision-making (7) involves approving or rejecting the proposal as well as establishing the conditions and terms for EIA's implementation.

Finally, EIA process should include follow-up in terms of ensuring that condition and terms of the approval are met. This is done by monitoring (8) the effectiveness of mitigation actions and the impacts of development. Also, environmental auditing (9) should be carried out while evaluating EIA process in order to optimize environmental management (10) as well as strengthening future EIA mitigation and applications measures.

There are several aspects of which EIA is concerned with. Some possible impacts that are dealt with EIA are outlined in Table 4.4 below.

Table 4.4 Checklist of impact categories for land development projects

(Wathern, 1995:11, cited from Schaenam, 1976)

<ol style="list-style-type: none">1. Local economy<ul style="list-style-type: none">-public fiscal balance, employment, wealth2. Natural environment<ul style="list-style-type: none">-air and water quality, noise, wildlife and vegetation, natural disasters3. Aesthetics and cultural values<ul style="list-style-type: none">-attractiveness, view opportunities, landmarks4. Public and private services<ul style="list-style-type: none">-drinking water, hospital care, education, transportation, shopping, energy services, recreation etc.5. Other social impacts<ul style="list-style-type: none">-people displacement, sociability/friendliness, privacy

As seen from the table EIA is mainly dealing bio-physical aspects. More in general, aspects concerned in EIA process normally include impacts related to air, water, climate, flora, fauna, soil, landscape, human health and safety, cultural heritage and socio-economic.

4.3 Social-Impact Assessment

Social-Impact Assessment (sIA) can be defined as “the process of identifying the future consequences of current or proposed action which are related to individuals, organizations and social macro-systems” (Becker, 2001: 312). SIA can be, similarly with EIA, originated with the 1969 NEPA of the USA. It can be said that SIA has emerged from social science disciplines, mainly sociology. Today a number of corporations have adopted sIA as their standard tool in forming policies but it is still mainly Western governments that use sIA (Becker, 2001). The methodology for sIA, as identified by Becker (2001), includes initial and main phase. Table 4.5 below provides a general overview.

Table 4.5 Flow-chart of a large-scale sIA
(modified from Becker, 2001:313)

<p>THE INITIAL PHASE IN AN SOCIAL IMPACT ASSESSMENT PROJECT</p> <ol style="list-style-type: none"> 1. Problem analysis and communication strategy 2. System analysis 3. Baseline analysis 4. Trend analysis and monitoring design 5. Project design
<p>THE MAIN PHASE IN AN SOCIAL IMPACT ASSESSMENT PROJECT</p> <ol style="list-style-type: none"> 6. Scenario design 7. Design of strategies 8. Assessment of impacts 9. Ranking of strategies 10. Mitigation of negative impacts 11. Reporting 12. Stimulation of implementation 13. Auditing and ex-poste evaluation

The Initial stage (1) is to analyse the problem, i.e. what is the nature of the problem. Also, having a solid communication at the beginning is important. This is because as different people have different values and thus there might be conflict between them. Communication should include stakeholders that are affected by the proposed action. Moreover, communication should last throughout the assessment. Next (2), system boundaries should be defined, i.e. identifying who are the relevant actors (stakeholders). This is followed by baseline analysis (3). This is important in a sense that the problem which should be mitigated has a history. Thus, it is vital to identify and understand what these problems were in order to come up with best mitigation strategies. Knowing the future is also important. This can be done through future analysis which is restricted to a critical inventory of trends (predicting future developments). Also (4), designing and institutionalising a monitoring system is important as it will provide information of the development of an action and it's wanted as well as unwanted impacts. Finally (5), before starting the main phase of the project there should be a careful evaluation of the so far findings. This involves then setting up the research questions as well as the overall design of the project.

The main phase starts with a scenario design (6). This should include three to five different scenarios for possible outcomes. Next (7), again three to five strategies for mitigating the problem should be designed. Then (8), assessment of impacts should be carried out by using artificial simulations by confronting them with different scenarios. The outcomes of these simulations would then indicate strengths and weakness of each strategy specified for each

scenario. This should be followed by ranking (9) the strategies in order to determine how a favourable strategy might show less favourable outcomes in another scenario. Actual ranking can be based on CBA or, if not applicable in monetary terms, use a MCA.

After finding weaknesses in the proposed action, redesigning (10) of the action should be taken place. This should be then simulated and ranked again and probably redesigned the action (preferably several times). Results should be then reported (11), preferably by multiple reporting. This includes written, oral and audio-visual presentations as well as work-shops. The latter would ensure that communication has taken place with stakeholders. Stimulation of implementation (12) in terms of participation between relevant stakeholders is important. This should be taken place throughout the process and continue after the assessment project (monitoring process, strategic learning). Finally (13), the auditing of the sIA project would provide information on its performance, applicability of the plan and actual process as well as cost-effectiveness. Doing an ex-poste valuation could provide important information of the assessment methods and the organization of the assessment for the impact assessment analysts.

There is no one way to list what to include as social impacts. A general categorization is provided in Table 4.6 below.

Table 4.6 General impact categories

(Juslen, 1995 cited in van Schooten *et al.*, 2003:76)

- | |
|---|
| <ul style="list-style-type: none">• Standard social impacts concerning noise level, pollution etc.• Psychosocial impacts such as community cohesion, disruption of social networks• Anticipatory fear• Impacts of carrying out the assessment• Impacts on state and private services• Impacts on mobility such as transport, safety, obstacles |
|---|

This generalised list is further developed by van Schooten *et al.* (2003:85-89) to include seven major categories of social impacts. These include the *health and social well-being*, focusing on health impacts (e.g. nutrition, mental health and actual physical health and fertility). Second is the *quality of the living environment*, dealing with aspects related to liveability of the neighbourhood and workplace (e.g. environmental amenity value/aesthetic quality, crime and violence, quality of the living environment). Third is the *economic impacts and material*

well-being, stressing impacts to the prosperity and wealth of individuals as well as to the community as a whole (e.g. standard of living, income, employment).

The fourth factor of social impacts (*Ibid.*) is the *cultural impact*, focusing on cultural issues (e.g. natural and cultural heritage, loss of local language or dialect, change in cultural values). *Family and community impact* compiles the fifth factor encompassing for example social differentiation and inequity, community cohesion, social tension and violence). The sixth factor is the *institutional, legal, political and equity impacts*; dealing with issues such as human rights, tenure or legal rights and participation in decision-making. The final category is the *gender relations*. The concern is laid on issues such as personal autonomy of women, political emancipation of women and wage labour.

5 Analysis I: selected assessment tools

In this chapter selected assessment tools, as discussed in previous chapter, are analysed regarding to their characters in terms of SD aspects. Each of the major aspects, as identified in chapter 3, is considered separately.

5.1 Economic aspects of SD

CBA can be arguably said to be useful for evaluating policies, plans and programmes in monetary terms. This assessment becomes also very valid for corporation as CBA could rather easily predict financial cost and more precisely cost and benefits of, for example, proposed project. Moreover it is a useful tool for assessing the efficient way of allocating resources (Hanley & Shoran, 2005). Thus, in principle, CBA aims for efficiency rather than sufficiency. The main problem of CBA is its simplicity in placing a monetary value for everything. In reality it becomes difficult to rate certain values, such as ecosystems and freedom, in money (Söderbaum, 2000). In general, it might be impossible to quantify and put monetary value for all relevant impacts. That is to say monetize everything as cost and benefits (Boardman *et al.*, 2001). However, as CBA is based on neoclassical economics discipline and as neoclassical thinking is the prevailing market paradigm it is easy to see why it has been such a popular tool. In fact, CBA is probably the most standardized method available.

In the turn of 1970s when environmental problems were given more attention, it became rather evident that CBA was not sufficient enough for addressing environmental aspects. EIA was believed to correct this insufficiency. Generally speaking EIA focuses on biophysical impacts. It does also include socio-economic aspects (Stolp, 2003) but not to same extent as CBA. In fact, EIA is more concerned with aspects such as fiscal policy, employment and wealth of the community. Nevertheless, EIA can show alternative ways of achieving the same objectives with a better environmental ends and even more economically vised (Wathern, 1995).

Similarly, it can be said that sIA also considers socio-economic aspects in the assessment but again it does not try to simply monetize impacts. Emphasizes is laid on well-being of individuals and wealth/prosperity of the community as a whole (van Schooten *et al.*, 2003).

5.2 Environmental aspect of SD

In the CBA, there is a concern of how to find a consensus of how to “value negative environmental impacts as a part of the attempt to find an optimal level of pollution control through marginal analysis” (Söderbaum, 2000:12). If there is no common agreement then CBA might not be sufficient enough alone for assessing environmental sustainability. Moreover, pollutant sinks such as atmosphere and watercourses are regarded as external costs and thus are not included in the analysis (Wathern, 1995). This clearly would hinder the environmental aspects of sustainability.

In general, EIA considers a wide range of environmental impacts. More particularly, impacts considered are subject to physical environment such as atmosphere, water resources, flora and fauna. Hence, EIA can be considered as a good tool for assessing environmental sustainability in terms of ensuring the quality of the environment. There are, however, some criticisms for example that little emphasizes is given to resource sustainability (Paehlke, 1999). In this sense EIA does not necessarily address the importance of preservation of energy resources and ecosystems. Also, it is argued that EIA is mainly used as a proposal approval. It does not have a proper feedback system (especially with older models) indicating that sound environmental management is ignored (Bisset & Tomlinson, 1995).

Environmental sustainability in sIA process is concerned with environmental impacts and their effects on social aspects, such as human health and well-being, as well as on cultural aspects, such as archaeological and community dimensions. Thus, it is not directed towards biophysical aspects of the environment, but rather possible environmental impacts linked to humans. This can be seen due to the nature of sIA which is mostly people-oriented.

5.3 Socio-cultural aspects of SD

CBA is supposed to bring solutions that are optimal from a societal point of view. It aims for finding best alternative in terms of net benefits. In other words, optimal choice would be the one in which potential 'losers' would be compensated by the 'gainers' and they both would still be better off (Boardman *et al.*, 2001). Moreover, these are determined in monetary terms based on willingness to pay concept. In reality, however, there are different ideological orientations among stakeholders and these might be difficult to measure in money (Söderbaum, 2000). In general, CBA is not appropriate tool for assessing social and cultural impacts as it fails to capture their intangible connection to each other (Srinivasan & Mehta, 2003). More particularly, cultural differences are not necessarily accounted for, especially in cases in which no data/survey of willingness to pay concept has not been carried out. In fact, CBA disregards different views posed by stakeholders (Boardman *et al.*, 2001)

EIA, on the other hand, is supposed to include social and cultural aspects in the assessment. Examples of these include aesthetical and health-related aspects. It is, however, argued that EIA actually fails to address them properly (Vanclay, 2004). Reasons for this can be seen due to its technocratic-orientation in which aspects that are measurable such as employment are only accounted (Stolp, 2003). In terms of public participation in the assessment process, such participation involvement is included in the EIA and thus indicating that interests and opinions of various stakeholders are heard (Glasson *et al.*, 2005). However, in general stakeholder participation is left to few meetings at most.

Socio-cultural impacts are the main concern in sIA process (Stolp, 2003). However, even with sIA there has been criticism that cultural aspects are not well included. Reasons for this can be seen due to emphasize laid on the impacts of individuals while impacts on society as a whole have been given lesser attention (Vanclay, 2004). Nevertheless, stakeholder participation is argued to be well included in sIA process.

5.4 Temporal and Spatial aspects of SD

In CBA, there are some problems of including intergenerational aspect. Knowing future generation's willingness to pay is difficult to measure simply because they are not born yet.

Similarly, it might be difficult to measure the willingness to pay for all the stakeholders especially if there are several involved in the scope of the assessment (Boardman *et al.*, 2001). These arguments would indicate that intragenerational thinking is also hard to implement. More importantly CBA makes an assumption that future impacts are applied in to one point in time (Söderbaum, 2000). In reality, uncertainty and complexity of ecosystems for example, makes it hard to make such basic assumptions (static) and still consider that in the future it would be still valid. More importantly, CBA is more a once-off project meaning that continuance of the process is ignored.

Spatial and temporal aspects in EIA depend of the nature of proposal (Glasson *et al.*, 2005). In general, it can be done at the local, regional or national level and even global (e.g. measuring CO2 emissions). Thus, it can be stated that intragenerational thinking is included. In terms of time scale of impacts EIA is normally taken to consider current impacts, up to 10 years and up to 20 years. This time scale might not be appropriate enough to conclude that future generations are considered. Nevertheless, EIA (especially revised versions) do have follow-up assessments. Thus, it can be said to be a continuing process with a feedback system.

Intragenerational –and intergenerational equity principles are seen to be part of the sIA (Vanclay, 2003). These can be seen in terms of wide collaboration with stakeholders and concerns of future impacts to people. It is also an ongoing process allowing feedback from different stakeholders (Baines, *et al.*, 2003).

5.5 Sustainability aspects and selected assessment tools

Based on the analyses seen above, the Table below (Table 5.1) fulfils the list as introduced in the method Chapter (3) and further developed in Chapter 4.

Table 5.1 Selected assessment tools compared to sustainability aspects

ASPECTS & CONCEPTS OF SUSTAINABLE DEVELOPMENT	SELECTED ASSESSMENT TOOLS
Economic	
<ul style="list-style-type: none"> -long-term growth -resource availability -efficiency/sufficiency -minimum consumption 	<ul style="list-style-type: none"> CBA -resource allocation and efficiency main concern EIA - socio-economic (employment, fiscal policy) included into some extend sIA -economic impacts related to well-being of individuals/ community
Environmental	
<ul style="list-style-type: none"> -ecological diversity and prevention -maintaining ecosystems 	<ul style="list-style-type: none"> CBA -basically only environmental optimization EIA -environment quality and diversity included sIA -environmental impacts related to human health/well-being
Socio-cultural	
<ul style="list-style-type: none"> -socio-cultural diversity -multi-stakeholder approach/dialogue -ideological and cultural orientation -justice, equity and transparency -human well-being 	<ul style="list-style-type: none"> CBA -basically only social optimization EIA -includes accountable aspects sIA -all well covered
Temporal and Spatial	
<ul style="list-style-type: none"> -intergenerational thinking -intragenerational thinking -continuing process 	<ul style="list-style-type: none"> CBA -static assumptions, temporal aspects questionable EIA -intragenerational aspects considered, weak long term thinking sIA -intra- and intergenerational aspect considered, ongoing process

As seen from the table each of the assessment tools emphasize different aspects. This would further indicate that none of the considered assessment tools are alone appropriate enough to assess sustainability impacts. In the next chapter newer sustainability assessment tools are considered.

6 Sustainability assessment: concepts and tools

In this chapter sustainability assessment is discussed. The first part will consider different aspects of sustainability assessment. Thereafter two such contemporary assessment tools are presented. The first one, SIA, is already been used whereas the latter, ISA, is still in a development level. Despite of this fact, ISA is considered to be more 'advanced' tool and thus providing better sustainability assessment.

6.1 Different concepts

Sustainability assessment, in general, can be understood as a part of impact assessment process tools. It is also viewed as an integrated assessment tool in terms of integrating different aspects of SD. Various sustainability assessment are mainly used by European Commission, among EU member states and other OECD (Organisation for Economic Co-operation and Development) countries. Moreover, it is used namely for public policy appraisal and evaluation. In these terms sustainability assessment can be defined as "the systematic assessment of the potential or actual effects of a public intervention on the economic, social and environmental 'pillars' of sustainable development" (George & Kirkpatrick, 2007:1). Sustainability assessment differs from other integrated assessment tools as it does not separate economic, environmental and social aspects but rather treats them as a whole. Moreover, it emphasizes interconnection and interdependence of these different aspects (Pope *et al.*, 2004).

As it has been discussed, defining sustainability in practical terms is rather difficult. Hence, in order to find out whether a proposed policy, plan or strategy would meet the objectives of SD becomes a difficult task, if not impossible. One of the biggest challenges can be seen due to various interpretation of what SD should encompass. It seems to be rather evident that one's definition of SD is value judged. To overcome such hindrances stakeholder participation in the assessment process becomes important. Thus, defining SD should not be solely scientifically based but rather within the consensus of stakeholders (Draaijers & Verheem, 2007). Söderbaum (2000), for example, stresses collaboration among stakeholders which the action would have an impact. Basically, sustainability assessment should be conducted in ways in which "ideological orientation of each actor or decision maker is matched against the

expected impact profiles of each alternative considered” (*Ibid*:79). Moreover, results should not be considered as a sole solution but rather as a conditional result. In this view, it is a social learning process for the analysts and various stakeholders involved (*Ibid*.). In this sense, sustainability assessment could be “applied proactively during the decision-making process to assess the sustainability of the various options proposed to meet a series of sustainability criteria” (Pope *et al.*, 2004: 607).

Scientists should not, however, been left out from the assessment process. Experts are useful, for example, identifying environmental (ecological) thresholds. Hence, stakeholders could be informed of some basic boundaries (e.g. toxic substance levels in drinking water) determined by scientists (Draaijers & Verheem, 2007). This would also easier the task of carrying out sustainability assessment in a sense that some basic definitions of SD have been put forward. In fact, Pope *et al.* (2004), for example stress the importance of having a clear vision of what sustainability encompasses.

6.2 Sustainability Impact Assessment

Sustainability Impact Assessment (SIA) was first developed in order to assess EU Commission initiatives. In fact, in 2001 the Gothenburg European Council Conclusions stated in the part on the EU Sustainable Development Strategy (EU SDS) for the introduction of "mechanism to ensure that all major policy proposals include sustainability impact assessment covering their potential economic, social and environmental consequences” (www, European Council, 2001:5). SIA can be described as “a systematic and iterative process for the *ex-ante* assessment of the likely economic, social and environmental impacts of policies, plans, programmes and strategic projects, which is undertaken during the preparation of them and where the stakeholders concerned participate pro-actively” (Arbter, 2003:175). The process of doing SIA shares a common structure with other *ex-ante* impact assessment (e.g. EIA). Table 6.1 below shows general steps of SIA process.

Table 6.1 SIA process

(modified from Paredis et al., 2006:16)

<ol style="list-style-type: none">1. Screening -describing and identifying the problem as well as actors and systems involved2. Scoping -establishing the institutional, methodological and practical constraints and requirements for the assessment3. Impacts prediction -analyzing the probable impacts of different alternatives and predicting outcomes4. Impacts evaluation -comparing different options and ranking their overall performance in terms of SD5. Reporting -explaining the results of the different stages, the methodologies and procedures pursued and representing pros and cons of the different alternatives
--

The first stage of SIA process is screening (1). First there should be a full problem description. This involves also identifying the causes of the problem as well as stakeholders and systems that might be affected of the problem. Additionally, there should be formulation and justification of the objectives of the wanted policy. This also includes formulating alternative policy options or ways how to actually reach objectives.

Next stage is scoping (2). Here, institutional, methodological and practical (e.g. budget, timeline) constraints and requirements of the assessment are established. Scoping is followed by impacts prediction (3). This stage involves analyzing and predicting the probable impacts of different alternatives. Ways of doing this includes identifying possible impacts of various policy options regarding to different SD aspects (economic, environment, social). Impacts prediction should be assessed with respect to, for example, duration, magnitude and likelihood of the identified impacts.

Impacts evaluation (4) is the following stage. Here different policy options or alternatives are compared. These are then ranked regarding to their overall performance in terms of SD. This implies that SD criterion is defined beforehand. In general, impacts evaluation is based on values and preferences rather than technical aspects. Finally is the stage of writing the final report (5). It explains the outcomes of different stages and procedures as well as used methodologies (followed). Also, pros and cons of the different alternatives are showed. The report is then used in the decision-making process.

6.3 Integrated Sustainability Assessment

The MATISSE (Methods and Tools for Integrated Sustainability Assessment) project, funded by the European Commission, aims for developing testing and demonstrating improved and new tools and methods for carrying out sustainability assessment. Moreover, it tries to improve Integrated Sustainability Assessment (ISA) of EU policies. ISA can be defined as “a cyclical, participatory process of scoping, envisioning, experimenting, and learning through which a shared interpretation of sustainability for a specific context is developed and applied in an integrated manner, in order to explore solutions to persistent problems of unsustainable development” (Weaver & Rotmans, 2006:12). Figure 6.1 below outlines the process of doing ISA.

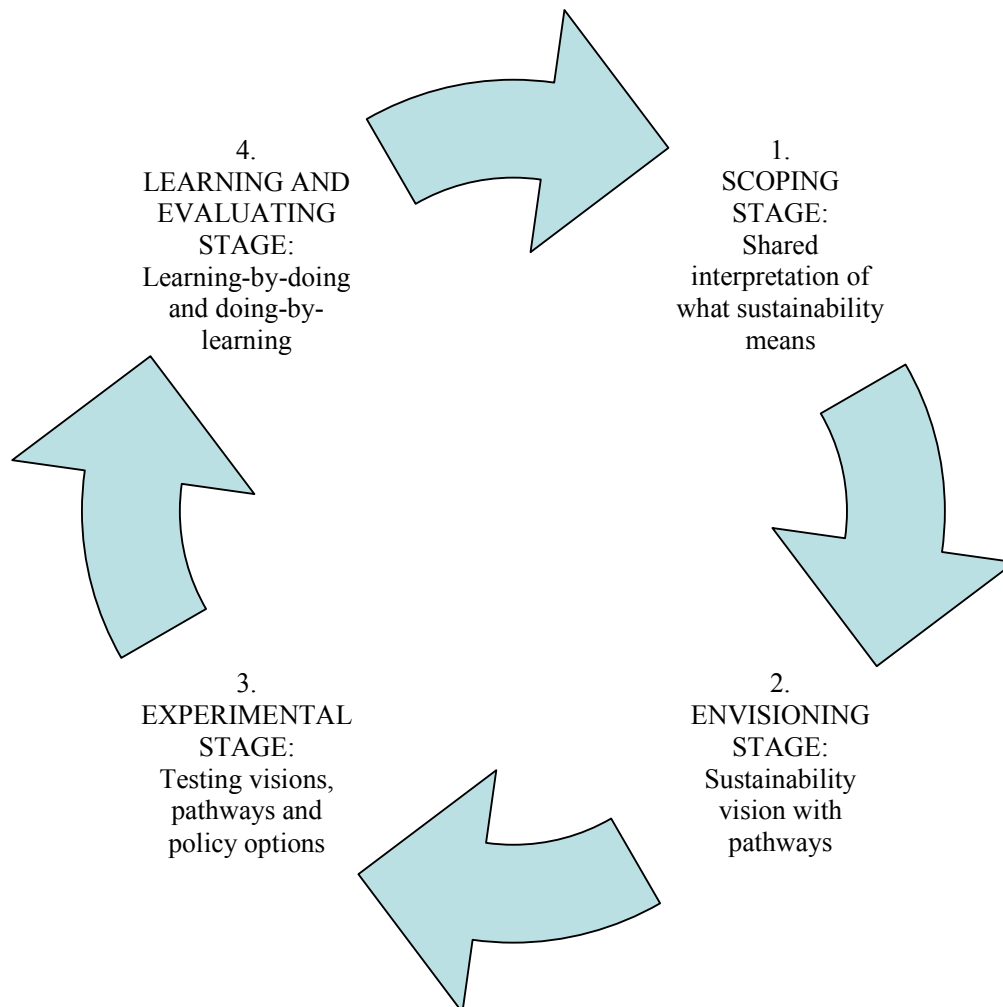


Figure 6.1 ISA as a cyclical process
(modified from Weaver & Rotmans, 2006:13).

The first stage in ISA process is scoping (1). This involves ‘defining’ sustainability by means of identifying unsustainability and problems related to that. Moreover, shared interpretation of SD and problem area should be based on stakeholder analysis as well as on integrated systems analysis. The former includes participatory methods with the most relevant stakeholders in the process. The latter consist of making spatial and temporal scales (up to 50 years). Next follows the envisioning stage (2). Here, unsustainability problems are turned into sustainability challenges. Basically, it means making a plan, with multiple scenarios, of how to achieve sustainability in the long run. Again, stakeholder participation is stressed.

The envisioning stage is followed by the experimental stage (3). The idea is to test sustainability visions regarding to its adequacy, consistency, feasibility and robustness. Emphasize is put on testing scenarios and their drivers to sustainability goals. The final stage is the learning, evaluating and monitoring stage (4). Here, experiences and lessons of the ISA process are evaluated as they would serve basis for the next ISA-cycle. Monitoring the different stages of the process is important in terms of understanding stakeholder perception along the way, i.e. how they have might changed and how much visions, experiments and pathways were adjusted.

7 Analysis II: sustainability assessment tools

In this chapter SIA and ISA are analysed. This is somewhat different compared to selected assessment tools as not much literature is available. Hence, the two sustainability assessment tools are first compared together. Thereafter, their characteristics are put into a wider concept of sustainability assessment as discussed in Chapter 6, and analysed in terms of sustainability aspects as identified in Chapter 4.

7.1 Comparison of SIA and ISA

As a part of the MATISSE project, some analyses of the differences between SIA and ISA have been made. Table 7.1 below outlines these comparisons.

Table 7.1 Comparison of SIA and ISA
(modified from Weaver & Jordan, 2006:9)

Dimension	Sustainability Impact Assessment (SIA)	Integrated Sustainability Assessment (ISA)
PARADIGM	Incremental	Transition
SCOPE	Narrow problem formulation	Broader systems view
SCALE	Single level	Multi-level
STAKEHOLDER	Regime	Niche
GOALS/CONSTRAINTS	Given	Searching, explorative
OBJECT	Partial	Holistic
LEARNING	Cognitive/one-off assessment	Social learning/iterative
POWER	Structural	Innovative/empowering

According to Weaver & Jordan (2006) SIA aims for shifting from known-stage to a new stage by stepwisely. ISA seeks this paradigm shifts as a part of the whole purpose of the process. In this sense the scope of ISA process is much broader as the policy is determined during the processes whereas SIA merely seeks considering trade-offs of certain policies. Hence, the scale and stakeholders vary between these two processes. In SIA policy is given from the top whereas in ISA policy is determined among stakeholders. Following this view SIA has predictive values whereas ISA is aware of complexity and uncertainties in SD concept (Rotmans, 2006). In other words, SIA aims considering trade-offs regarding to multiple impacts that certain policies might lead to whereas ISA tries to be sustainability oriented from

the beginning. Also, ISA stresses social learning (learning by doing, improving) whereas SIA is a single process. In this sense power influence is deterministic in SIA (top-down) whereas in ISA this is more pioneering (down-up).

7.2 Sustainability aspects

Within SIA it is argued that economic, environmental and social aspects are considered in terms of their effectiveness to proposed policies (Paredis *et al.*, 2006). Effects and impacts of these different sustainability aspects are assessed respectively against the policy. In other words, effectiveness is seen as a consistency between the planned action and the policies' expected goals. Moreover, as SIA process can be strengthened with other assessment tools, such as CBA and EIA, different sustainability aspects would be included in the assessment (Draaijers & Verheem, 2007). ISA can be understood as a tool for evaluating overall economic impacts from a long-run perspective. Similarly to SIA, ISA also aims for integrating various assessment tools in order to make a more holistic sustainability assessment.

SIA aims for long-term efficiency by identifying long-term environmental impacts (Paredis, *et al.*, 2006). In this sense resource availability and ecological diversity thinking is strongly considered in SIA process. However, in terms of temporal aspects, SIA is argued to focus on short-term impacts whereas ISA is more long-term oriented (Rotmans, 2006). Moreover, SIA is a single project which would hinder true sustainability aim. ISA, on the other hand, is designed to be a continuing (cyclical) process and thus sustainability outcomes would be better ensured. This would also ensure that short-term interests are diminished while long-term visions would be given more emphasize (Hertin *et al.*, 2007).

SIA is said to include stakeholder participation and that they are participating proactively (Arbter, 2003). This would ensure ideological and cultural orientation of the assessment process. However, as seen above this is not necessarily as strong as with ISA.

7.3 Sustainability aspects and sustainability assessment tools

In the Table below (Table 7.3) sustainability aspects are compared to SIA and ISA in a similar manner as in Chapter 5 and Table 5.1.

Table 7.3 Sustainability assessment tools compared to sustainability aspects

ASPECTS & CONCEPTS OF SUSTAINABLE DEVELOPMENT	SUSTAINABILITY ASSESSMENT TOOLS
Economic	
-long-term growth -resource availability -efficiency/sufficiency -minimum consumption	SIA -proposal effectiveness to economic aspect, resource availability, ISA -considering overall effects from long-term perspective
Environmental	
-ecological diversity and prevention -maintaining ecosystems	SIA -impacts to ecological diversity and environment in general ISA -considering overall impacts from long-term perspective
Socio-cultural	
-socio-cultural diversity -multi-stakeholder approach/dialogue -ideological and cultural orientation -justice, equity and transparency -human well-being	SIA -stakeholder participation included ISA -strong stakeholder participation, defining sustainability together
Temporal and Spatial	
-intergenerational thinking -intragenerational thinking -continuing process	SIA -short-term focus, general spatial dimensions, single project ISA -long-term vision, overall spatial dimensions, cyclical process

As seen from the table above both SIA and ISA aim for a holistic assessment. ISA, however, seem to be more sustainability-oriented especially in one respect, namely its long-term emphasize.

8 Discussion

In this chapter, analyses from previous chapters constitute a backbone for a discussion from a corporate perspective. They are also discussed from the standardization point of view which entails the notion of corporate practices for assessing sustainability. In the table (Table 8) below previous findings are summarised together. These are discussed further in the following sections.

Table 8. Comparison of assessment tools and their sustainability aspects

ASPECTS & CONCEPTS OF SUSTAINABLE DEVELOPMENT	SELECTED ASSESSMENT TOOLS (CBA, EIA, sIA)	SUSTAINABILITY ASSESSMENT TOOLS (SIA, ISA)
Economic		
-long-term growth -resource availability -efficiency/sufficiency -minimum consumption	CBA -resource allocation and efficiency main concern EIA - socio-economic (employment, fiscal policy) included into some extend sIA -economic impacts related to well-being of individuals/ community	SIA -proposal effectiveness to economic aspect, resource availability, ISA -considering overall effects from long-term perspective
Environmental		
-ecological diversity and prevention -maintaining ecosystems	CBA -basically just environmental optimalization EIA -environment quality and diversity included sIA -environmental impacts related to human health/well-being	SIA -impacts to ecological diversity ISA -considering overall impacts from long-term perspective
Socio-cultural		
-socio-cultural diversity -multi-stakeholder approach/dialogue -ideological and cultural orientation -justice, equity and transparency -human well-being	CBA -basically just social optimalization EIA -includes measurable aspects sIA -all well covered in terms of individuals, community thinking lacking	SIA -stakeholder participation included ISA -strong stakeholder participation, defining sustainability together
Temporal and Spatial		
-intergenerational thinking -intragenerational thinking -continuing process	CBA -static assumptions, temporal aspects questionable EIA -intragenerational aspects, weak long term thinking sIA -intra- and intergenerational aspect considered, ongoing process	SIA -short-term focus, general spatial dimensions, single project ISA -long-term vision, overall spatial dimensions, cyclical process

8.1 Corporation discourse thinking

As discussed in Chapter 4, many of the scholars criticised neo-classical economic thinking. Moreover, it seems that this has been the main paradigm in current world affairs already for a while. Putting this into context of standardization, one can argue that the whole concept of neo-classical economics has been shaping the business sector. When considering the business schools around the world, it become evident that profit maximization is the sole ideology in their teaching. In general, other disciplines might have not been so popular and are thus given less priority. Moreover, as environmental and social aspects are so complex and multilevel, understanding such issues become difficult. There are own disciplines that are mainly concerned of one of the aspects (e.g. ecology-environment, psychology-social etc.). Hence, business economics have dealt with issues that they are intended, i.e. how to do business and make profit. In the light of these arguments it becomes rational to say that the corporate paradigm thinking (as a standard) has been based on neo-classical economics. This could be understood as the reason why many of the corporations might not be operating ‘sustainably’.

Other disciplines emphasized many of the ‘softer’ values in sustainability. These are still widely ignored in the business sector as they are believed to bring additional cost. As Friedman (1970) argued, businesses’ sole purpose is to make profit. Putting this in the context of stakeholder-thinking, yes it is true (partly). A company must consider its shareholders who are mainly concern of their stocks and getting financial benefits. Managers’ jobs are dependent of their results and if such results are not profitable they might get fired. Workers also are dependent of the company’s financial performance. No company will last in a free-market society if it makes losses all the time. In such a case, company can not afford to keep people in a payroll and thus might be forced to lay-off people.

There are however, several other stakeholders who are directly or indirectly affected by the corporation. Such actors include governments, local communities and individuals at all levels of aggregation, suppliers and their workers, other companies sharing the same market, consumers etc. In addition, there are other than human-related stakeholders. These include all the living species and plants which might be affected by the corporation’s actions. Most importantly, all of them are interconnected to wider concepts such as biodiversity, ecosystems and social networks. As with SD there are trade-offs between various stakeholders. Hence, the

company should not just be concerned of making profit for its internal stakeholders' sake with the expense of the other stakeholders. Rather, to become more sustainable corporations need to change their way of seeing the world as put it in Thin (2002) terms. How to do this can be through widening corporate decision-making to include other than neo-classical economic aspects (short-term profit-maximising). Putting it in simple terms, corporation should have a pluralistic and open approach to ensure that other values and aspects of SD are considered and taken into account in the decision-making process (Alvesson & Wilmott, 1996). Obviously one way of improving this would be with improved *ex-ante* assessments.

8.2 Corporations and sustainability aspects considered

In Chapter 4 some aspects of SD were pointed out. Even though these were rather general and perhaps abstract, they would still provide some ideas what it takes to become more sustainable.

In regard to economic aspects long-term benefits thinking is vital in many ways. First of all, this would ensure that short-term profit maximization and its possible negative impacts are overseen. This is to say that a long-term commitment from the company would guarantee that sustainability aspects are better ensured. Similarly, resource availability would be taken into consideration as they would not be exploited immediately. Moreover, efficiency aspects, especially in terms of energy use, would probably make the company not just more competitive in the long run but also more environmentally friendly in its activities (Porter & Linde, 1995). However, efficiency without sufficiency is like an empty shell (Sachs, 1998). For example, producing more environmentally friendly cars would not do any good at the end as the greater number of cars would overrule the net benefits of energy efficiency. In other words, just producing cars as the main mean of transportation is not enough. One should consider other alternatives such as cycling, buses etc. In this sense, minimum consumption is an important concept.

Environmental aspects are important in many ways. Every one of us is dependent of ecosystems surrounding us. Nature provides means for production of food, oxygen, water, medicines and such. Moreover, due to the complexity of ecosystems and the environment in general, it is vital that corporation's activity would have a minimal impact to nature. For

example, introducing unknown substances, without knowing its possible impact to nature, in to watershed might have long and wide lasting consequences. Fixing it afterwards might be costly and bring negative publicity from NGOs and other stakeholders.

In terms of socio-cultural aspects several points can be made for its importance to corporations. As with the natural environment, societies and human networks in general are seen as complex and multi-faced. Hence, corporations should be aware of cultural differences and customs especially when operating in 'foreign' environments. Similarly, it should be noted that individuals are also different with unique values and preferences. Being aware of such differences and aiming for transparency, corporations would better ensure that they are operating in sustainable manner in terms of these aspects. Open dialogue and wide stakeholder participation could be seen as attractive ways of ensuring this. Moreover, corporations should prioritize human well-being of its own internal as well as external stakeholders. In this way they would not just be more sustainable but probably gain wider acceptance for their activities.

Many of the MNCs are operating world wide. Several of them are also very influential and powerful actors and thus actions taken by them might have long lasting and wide impacts. This is to say that many people (as well as natural environment) might be affected by them. Hence, corporations should not make any decisions without consulting other relevant stakeholders. Moreover, considering long-term aspects become important as entire communities, even nations, might be dependent of these corporations, especially in the developing countries. In this sense, it is also vital that corporations understand that SD is a continuing process which will be shaping over time. In fact, SD can be seen as an open-ended project (Dryzek, 2005) and thus revising the situation would better ensure spatial and temporal aspects of sustainability. Predicting future impacts is of course a difficult task. Nevertheless, a corporation should try envisioning and being aware of such dimensions. In more practical terms, it might be useful to make 5 to 10 year impact evaluations and revise them in regular intervals. This would also ensure that there is a feedback provided and problems encountered can be re-evaluated.

Most importantly, corporation should understand that the division of the three aspects (economic, environmental and social-cultural) with temporal and spatial dimensions should

be considered as a whole. This is because there are trade-offs between these aspects and thus concentrating on one or two of the aspects would have an impact on the other.

8.3 Corporations and analysed assessment tools

In Chapter 4 some of the existing assessment tools (CBA, EIA and sIA) were discussed. In terms of standardization CBA and EIA are well-established and thus commonly used. Other reason for this, especially with the former, can be seen due to its roots on neo-classical economics. As argued above neo-classical economics thinking was seen as the prevailing discipline paradigm in the world. sIA, on the other hand, has not been able to gain a legal mandate and is thus less commonly used (Vanclay, 2004). This could be seen due to its foundations rooted on social science disciplines (namely sociology), lack of generally agreed standards of doing sIA and its more abstractive assessment methods (*Ibid.*).

These selected assessment tools were also analysed (Chapter 5) regarding to which of the sustainability aspects they covered. As it seems obvious the selected assessment tools (CBA, EIA and sIA) covered different aspects. In general, it can be said that CBA focused on economic aspects (costs and benefits), EIA on environmental aspects and sIA on social aspects. Moreover, CBA evaluates impacts in monetary terms while EIA concentrates on measurable bio-physical aspects. Hence, CBA and EIA are rather similar in their evaluation methods as both of them focus on quantitative analysis. sIA, on the other hand, emphasizes evaluating impacts related to humans. Such impacts concerned in sIA process are more abstract than with the case of CBA and EIA. sIA requires more participatory tools such as interviews and stakeholder meetings. Thus, it could be argued that sIA is more qualitative-oriented than the other two assessment tools.

From the corporate perspective it would be unpractical to conduct all of the assessments for every policy, plan or project. It could be rather time consuming and resource intensive if carried out properly. However, relying on only one of the assessment tools would not be adequate enough to predict sustainability impacts.

SIA and ISA, on the other hand, have more holistic view in terms of assessing various sustainability aspects. These tools share many of the attributes with the other discussed

assessment tools. Hence, from the corporation perspective it might be useful to modify SIA and ISA to better serve their purposes. More importantly SIA and ISA are closer to sustainability assessment concepts (as discussed in Chapter 6.1) and different discipline perspective of sustainability aspects. Neither of them is standardized as an assessment tool. In fact, different variations of SIA have been developed and used by number of governments (namely in the EU) while, as said above, ISA is still applied only on theoretical level. After all, as discussed above, these tools are used or aimed to provide better assessment for government activities. This could be seen as the major obstacle why these tools are not widely used and not even applied to corporate level. Their assessment processes can also be seen as complicated, time consuming and resource intensive and thus unattractive to companies.

8.4 Assessing sustainability from the corporate perspective

What should corporations then emphasize in their assessment processes? As noted above none of the selected assessment tools were adequate enough to consider all the sustainability aspects stressed by different disciplines. SIA and ISA were argued to better ensure these aspects in their assessment processes but lacked formal standards for carrying out the assessment. Nevertheless, each and every one of the discussed assessment tools have some attributes which could be useful for corporate sustainability assessments.

CBA is definitely attractive in its way of considering cost and benefits (efficient allocation of resources). After all, budget considerations are very important for any corporation. EIA and its emphasizes on measurable bio-physical aspects would be also practical in terms of making solid calculations of possible negative impacts. SIA, in turn, is useful as it would include softer values (socio-cultural) and more individualistic impact aspects as it considers other than monetary/quantitative measures. Hence, corporations could be better-off from the NGO and local community pressure that they might otherwise encounter. SIA and ISA, on the other hand, have more holistic approach and include, especially, stronger stakeholder participation as well as temporal and spatial dimensions in their assessment processes.

This study suggests that, in general, corporation should shift from short-term profit maximisation to long-term profit-maximisation. In fact, all of the sustainability aspects should be considered as whole rather than separate entities. Recognising various stakeholders (those

who might have an impact of the action) is vital. This should also include nature-related stakeholders such as living plants and animals (biodiversity). Socio-cultural aspects should be considered carefully especially aspects related to social- and cultural differences (e.g. equity, gender, religion). Corporations should think about other than direct impacts. In this sense it is important to have wide and long lasting visions, built on intra- and intergenerational thinking. The study also suggests that corporation should be aware that SD might change over time and thus the actual assessment should not be regarded as a single project. Instead, there should be a feedback system which would allow re-evaluations of the situation.

9 Conclusions

The final chapter of this thesis is going to draw some conclusions of the study. This is followed by a short epilogue.

This thesis aimed at providing some suggestions of what should be emphasized in sustainability assessment processes. In order to reach this, the paper first looked at the concept of SD from the different discipline perspectives. Next, selected assessment tools (CBA, EIA and sIA) were looked at and compared to different discipline perspectives. Similarly, the newer sustainability assessment tools (SIA and ISA) were analyzed. Based on the analysis made above it was possible to draw some conclusions what corporations should emphasize. The following bullet points summarize the key messages of this study:

1. Disciplines' perspectives to SD
 - Different disciplines stress different aspects of SD
 - some similarities possible to draw
2. Selected assessment tools (CBA, EIA, sIA)
 - well-established
 - concentrates on different sustainability aspects
 - none of the them alone would fulfil the requirements for assessing sustainability sufficiently
 - they do, however, have positive features
3. Newer sustainability assessment tools (SIA, ISA)
 - not well-established
 - complicated, time consuming and resource intensive
 - more holistic approach
4. What should corporations emphasize?
 - long-term profit maximisation
 - different aspects of SD
 - Integrating different tools and their positive features

The following figure (Figure 9) illustrates different aspects of SD.

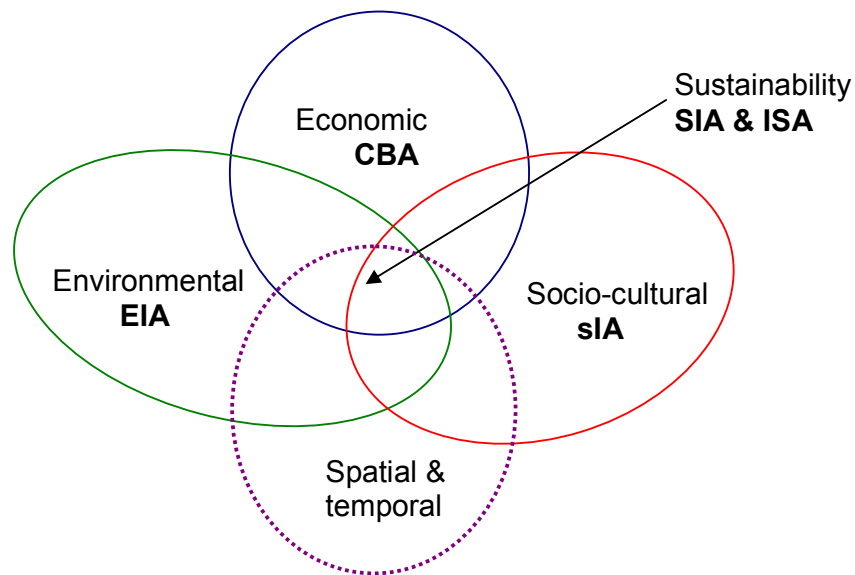


Figure 9. Different aspects of SD

Each of the aspects should be considered as essential aspects that should be given attention in the assessment process. The middle part, Sustainability, presents ideal situation in which all of the aspects are taken into consideration. In general this means considering economic, environmental, socio-cultural, spatial and temporal aspects of sustainability in the assessment process. The tools placed in the figure should be seen as their optimal potentials of assessing specific sustainability aspect. As none of the existing assessment (CBA, EIA, sIA) tools take all of these into consideration, they can not fulfil the requirements for assessing sustainability sufficiently. The newer sustainability assessment tools (SIA, ISA) would better ensure that all of the dimensions are considered in their assessment processes. However, as SIA and ISA are not well-established and are rather time consuming and resource intensive, one possible way to strengthen corporate assessment methods would be integrating positive features from each of the considered assessment tools.

9.1 Epilogue

As mentioned in the method Chapter (Chapter 2), this thesis mainly provided rather theoretical insights. In order to see practical implications of sustainability assessment tools and especially from the corporate perspective, a case study analysis should be made. Only by testing sustainability assessment processes in real life situation one could be able to analyse

their true value. Moreover, as each of the assessment tools is complex and multifaceted a more careful analysis of them should be taken before determining their applicability for the sustainability assessment processes. These could be then seen as possible future studies.

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Appendices

Appendix table 1. WBCSD's 10 messages by which to operate

(www, WBCSD)

<ul style="list-style-type: none">• Business is good for sustainable development and sustainable development is good for business. Business is part of the sustainable development solution, while sustainable development is an effective long-term business growth strategy.• Business cannot succeed in societies that fail. There is no future for successful business if the societies that surround it are not working. Governments and business must create partnerships to deliver essential societal services like energy, water, health care and infrastructure.• Poverty is a key enemy to stable societies. Poverty creates political and economic instability, a big threat to business and sustainable development. By contrast, businesses can lift living standards and eradicate poverty.• Access to markets for all supports sustainable development. Sustainable development is best achieved through open, transparent and competitive global markets.• Good governance is needed to make business a part of the solution. Supportive frameworks and regulations are needed for business to contribute fully to sustainable development.• Business has to earn its licence to operate, innovate and grow. The way business acts and is perceived is crucial to its success. Accountability, ethics, transparency, social and environmental responsibility and trust are basic prerequisites for successful business and sustainable development.• Innovation and technology development are crucial to sustainable development. They provide key solutions to many of the problems that threaten sustainable development. Business has always been, and will continue to be, the main contributor to technological development.• Eco-efficiency – doing more with less - is at the core of the business case for sustainable development. Combining environmental and economic operational excellence to deliver goods and services with lower external impacts and higher quality-of-life benefits is a key sustainable development strategy for business.• Ecosystems in balance – a prerequisite for business. Business cannot function if ecosystems and the services they deliver, such as water, biodiversity, food, fiber and climate, are degraded.• Cooperation beats confrontation. Sustainable development challenges are huge and require contributions from all parties — governments, business, civil societies and international bodies. Confrontation puts the solutions at risk. Cooperation and creative partnerships foster sustainable development.
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Tryck: SLU, Institutionen för ekonomi, Uppsala 2008.

Distribution:

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