Chapter 1: Introduction to Sustainability

1.1 International History of Sustainable Development

1.1.1 Environmentalism

"*It is entirely possible that when the history of the twentieth century is finally written, the single most important social movement of the period will be judged to be environmentalism*" (Nisbet, 1982).

The enlightenment period of the eighteenth century emphasised the importance of the individual, his freedom as well as his liberation. In this spirit of rationality, individualism, naturalism and utilitarianism Adam Smith (1723-1790) wrote a very important and influential economic textbook *An Inquiry into the nature and causes of wealth of nations* (Blignaut, 1995).

Smith showed a propulsive force that would put society on an upward growth path and a self-correcting mechanism that will keep it there (Heilbroner as cited in Blignaut, 1995). Smith's model is often referred to as an economic growth model that leads to the belief that economic growth will provide prosperity and answers to the quest of humanity.

The goal of economic growth was further enhanced by the experimental philosophy of the late 1800's that the engines of human progress were scientific rationality and social utilitarianism. Bacon added the perspective that knowledge is a means, not an end and should be expressed and applied in technology to provide the means by which humans can assume power over the material world (Jones as cited in Rees, 1988).

In this spirit the industrial revolution of the nineteenth century took place. In Britain this revolution caused an early consciousness of the effect of industrialism on the human environment and in 1863 the first environmental protection legislation was tabled in the UK, namely the Alkali Act of 1863. The Great London Smog incident in 1952 also resulted in a stream of public health and other legislation, e.g. the Clean Air Act of 1956 (Lichfield, 1988).

After the second World War, decision makers at government level realized that available planning tools were not sufficient to address the environmental and social problems that were starting to emerge: Acid rain, global climate change, ozone depletion, species extinctions, pollution, urbanisation etc. Nonetheless, the goal of economic growth remained. This goal has mainly been pursued by means of industrialism; regardless of whether the economic system is capitalism or communism, or however devastating the effects on the environment or human health (Porrit and Barbier as cited in Blignaut, 1995).

By the mid-twentieth century a minority started to realize the interconnections between the environment, economy and social well-being. The publication of Rachel Carson's "Silent Spring" in 1962 is considered as a turning point in the understanding of the importance of these interconnections. This publication was in line with the wave of environmental concern that the USA was experiencing in the 1960's and various non-government organisations were formed in that decade to promote environmental awareness.

Since the mid-1960's analysts warned that there was a consistent shift in public preference towards a greater emphasis on environmental protection and qualification of environmental quality (Inglehart as cited in Caldwell, 1989). The USA came to the realisation that a piecemeal approach to environmental legislation was no longer sufficient and this led to the USA's *National Environmental Policy Act (NEPA) of 1969* (Glavovic, 1984).

Although the USA and many other countries had environmental legislation dealing with various effects in place by 1969, NEPA represented the fist comprehensive commitment of any modern state towards the responsible custody of its environment. NEPA was nevertheless widely criticised by scientists as " *a dishonest or distorted use of science*" (Caldwell, 1989).

Mechanisms to protect the environment became a worldwide phenomenon and 1971 saw the introduction of the "Polluter Pays" principle by the Organisation for Economic Co-operation and Development (OECD) Council. In the same year the International Institute for Environment and Development (IEED) was established in Britain and more emphasis was placed on economic development that does not destroy the environmental resource base.

In 1972 the United Nations held a Conference on the Human Environment in Stockholm. At this conference it was decided that, *"although states have a right to exploit their own resources pursuant to their own environmental policies, they nevertheless have a responsibility to ensure that activities within their borders do not cause damage to the environment of other states or areas beyond their limits of national jurisdiction"* (Sampson, 2001). This conference resulted in the establishment of many national environmental protection agencies as well as the United Nations Environmental Programme. The conference, however, focused solely on industrial pollution of air and water, while deeper ecological and social problems were not dealt with (Ferrero & Holland,2002).

In 1973 Schumacher (as cited in Blignaut) warned that: " *Modern man does not experience himself as part of nature but as an outside force destined to dominate and conquer it. He even talks of a battle with nature, forgetting that, if he won the battle, he would find himself on the losing side*". This can be seen as one of the first references of what is currently known as sustainable development.

2

1.1.2 Sustainable Development Defined

In 1980 the International Union for the Conservation of Nature (IUCN) (also known as World Conservation Union) in cooperation with the United Nations Environmental Program (UNEP) and the World Wildlife Fund (WWF) formulated the World Conservation Strategy. The concept of "sustainable development" was subsequently formally introduced, since the strategy recognized *"the planet's capacity to support people is being undermined by poor land management, profligate use of resources, and the sort of grinding poverty that forces people to destroy the very resources they need to survive"* (as cited in Ferrero & Holland, 2002). The United National General Assembly's 38th session meeting in 1983 led to the creation of the World Commission on Environment and Development (WCED) under the auspices of Ms. Gro Harlem Brundtland.

In 1987 the WCED finally published its now famous Brundtland Report as *"Our Common Future"*. In this report the term sustainable development was formally accepted and used for the first time. The commission defined sustainable development as *"development that meets the needs of the present without compromising the ability of future generations to meet their own needs"*. According to Rees (1988) the commission defined needs as the *"essential needs of the world's poor to which overriding priority should be given"* and it also recognized the *"limitations imposed by the state of technology and social organization on the environment's ability to meet those needs"*.

According to MacNeill (as cited in Rees) the book "Our Common Future" stimulated unprecedented levels of public discussions of the tensions between the environment and the economy in countries worldwide.

In 1990 the International Institute for Sustainable Development (IISD) was established followed by the World Business Council for Sustainable Development (WBCSD) in 1992.

In 1992 the United Nations Conference on the Environment and Development was held in Rio de Janeiro. The result of this conference was two important documents:

- Rio Declaration on Environment and Development: A statement of twenty-seven principles that sets out the basis upon which states and individuals are to co-operate to further develop international law in the field of sustainable development.
- Agenda 21: A blueprint or action plan for the implementation of sustainable development (Sampson, 2001).

The Rio Conference also accelerated the development of international environmental law reflecting principles seen as basic obligations of states (Sampson, 2001). A follow-up to the Rio Conference was the establishment of the Earth Council in 1992 as well as the first meeting of the Commission on Sustainable Development and the World Summit on Social Development, both held in 1995. Various international protocols with regard to environmental concerns were also agreed upon in this time period, e.g. Kyoto Protocol in 1997. In 1999 the first global sustainability index was launched and in 2000 the United Nations Millennium Summit took place that highlighted the importance of a fairer world economy in an era of globalisation.

In August 2002 the World Summit on Sustainable Development (WSSD) was held in Johannesburg to review global change in the ten years after the Rio summit. The slogan of the conference was "People, planet and prosperity" and it focused on five areas of concern: water and sanitation, agriculture, health, energy and biodiversity. It is believed by some that this summit shaped the future of a globally defined, sustainable development agenda; while others think the summit was a total failure with no meaningful outcomes (Zwecker, 2002).

1.2 The concept of "Sustainable Development"

1.2.1 Fundamentals of Sustainable Development

There are currently over 100 definitions of sustainability and sustainable development (WBCSD, 2002) and although the concept is understood intuitively it remains difficult to express it in concrete, operational terms (Briassoulis, 2001).

The World Bank distinguishes between three different aspects of sustainable development: economical, social and environmental, and believes that sustainable development can only take place if the objectives of all three aspects are equally taken into account during decision-making processes (World Bank Group, 1998). The different aspects and objectives are depicted in Figure 1.1. Most definitions agree on these three main objectives.
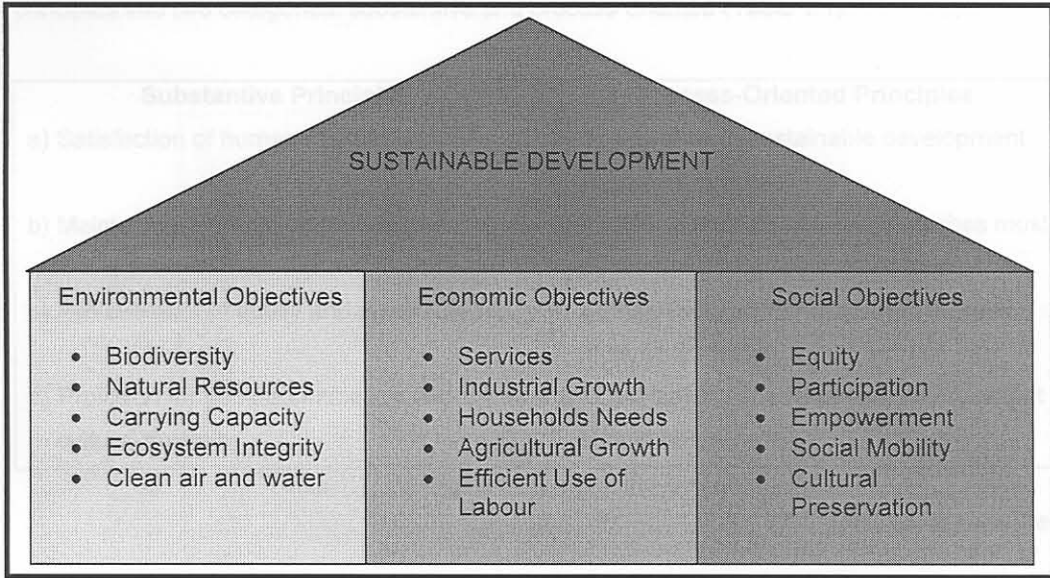
Figure 1.1: Objectives of Sustainable development

According to Briassoulis (2001) "*Sustainable development can be conceptualized as a state of dynamic equilibrium between societal demand for a preferred development path and the supply of environmental and economic goods and services to meet this demand*" as shown in Figure 1.2.
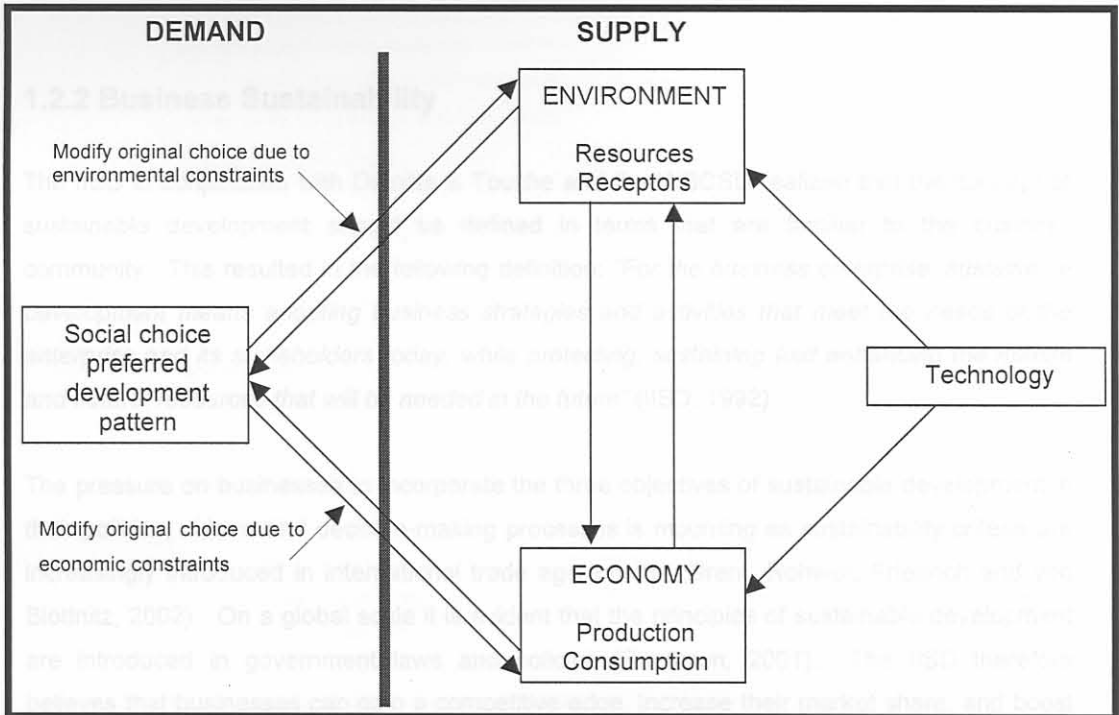

Figure 1.2: Schematic Presentation of Sustainable Development

Gardner (1989) identified eight principles for Sustainable Development and divided the principles into two categories: substantive and process-oriented (Table 1.1).

Substantive Principles	Process-Oriented Principles
a) Satisfaction of human needs.	a) Approaches to sustainable development should be goal seeking.
b) Maintenance of Ecological Integrity.	b) Analytical aspects of the approaches must be relational and systems-oriented.
c) Achievement of equity and social justice.	c) Strategies for sustainable development must be adaptive.
d) Provision for self-determination and cultural diversity	d) Organization for sustainable development should be interactive.

Table 1.1: Principles of Sustainable Development

Source: Gardner, 1989.

It is evident that there is consensus on the objectives and basic principles of sustainable development but the details of how to achieve sustainable development or maintain sustainability are difficult to generalize as *"perceptions of and necessary actions for achieving sustainable development differ between social-cultural and political contexts and change over time"* (Lele, 1991; Henderson, 1994; O'Riordan & Voisey, 1998;Kane, 1999; Mormont et al., 1999; Schleicher-Tappeser,1999 as cited in Braissoulis, 2001). This is especially true from the business perspective.

1.2.2 Business Sustainability

The IISD in conjunction with Deloitte & Touche and the WBCSD realized that the concept of sustainable development should be defined in terms that are familiar to the business community. This resulted in the following definition: *"For the business enterprise, sustainable development means adopting business strategies and activities that meet the needs of the enterprise and its stakeholders today, while protecting, sustaining and enhancing the human and natural resources that will be needed in the future"* (IISD, 1992).

The pressure on businesses to incorporate the three objectives of sustainable development in their policies, culture and decision-making processes is mounting as sustainability criteria are increasingly introduced in international trade agreements (Brent, Rohwer, Friedrich and von Blottnitz, 2002). On a global scale it is evident that the principles of sustainable development are introduced in government laws and policies (Sampson, 2001). The IISD therefore believes that businesses can gain a competitive edge, increase their market share, and boost shareholder value by adopting and implementing sustainable practices.

IISD is also of the opinion that industry is on a three-stage journey towards sustainable development as graphically shown in Figure 1.3 and Table 1.2. (http://www.bsdglobal.com/sd_journey.asp).
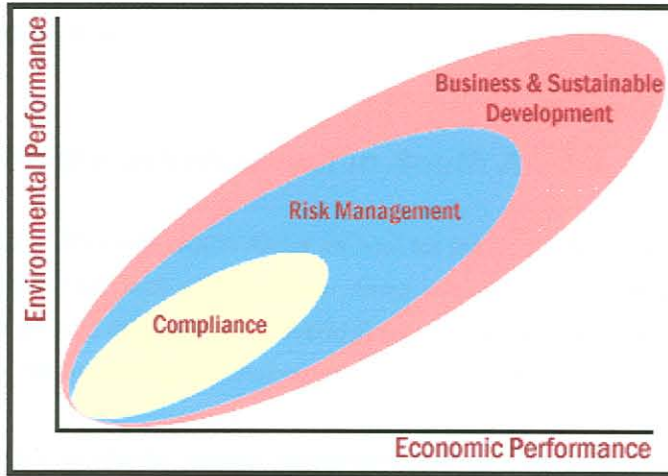

Figure 1.3: Three-stage journey towards sustainable development

Source: http://www.bsdglobal.com/sd_journey.asp

Stage 1: Compliance

The first stage is compliance with any regulatory measures or legislation. Most regulatory measures or legislations that are applicable to business focus on environmental aspects and most companies follow a reactive approach by making use of remediation and abatement measures. Environmental protection is often seen as an unnecessary costly burden during this stage.

Stage 2: Risk Management

Environmental risk management is stage two of the journey and companies enter this stage when they adopt more proactive strategies in dealing with environmental issues. Companies choose to go beyond compliance when the cost benefits of the risk management approach are realized.

Stage 3: Sustainable Development Strategies

The last stage is the stage in which companies start to incorporate sustainable development into their business strategies in pursuit of economic, environmental and community benefit. Environmental Quality, increase in wealth and enhancement in competitive advantages are the objectives that must be satisfied by win-win situations.

Table 1.2: The Three-Stage journey towards sustainable development

Source: http://www.bsdglobal.com/sd_journey.asp

Companies moving into stage three are increasingly concerned about initiatives such as corporate responsibility[1] and accountability[2], product stewardship and cleaner production mechanisms. Reporting of company sustainability is also an initiative undertaken by companies in stage three.

1.3 Sustainable Development in South Africa

The importance of choosing South Africa as host for the 2002 World Summit is emphasised through the citation of Cock (1991): *South Africa with its mix of First World environmental problems such as acid rain, and Third World Environmental problems such as soil erosion, is a microcosm of the environmental challenges facing the planet".*

South Africa has implemented various legislations over the past decade to ensure sustainable development and compliance with international expectations (Sampson, 2001). The global environmental drive in the marketplace has also been the catalyst for sustainability in South Africa and for this reason most of the legislation focused on environmental aspects. Legislation dealing with social aspects has been tabled but unlike environmental legislation it does not currently affect South African businesses in a direct way. The history and role of sustainable development can therefore be seen against the background of the way in which South Africa dealt with the environmental aspects.

1.3.1 Apartheid era

According to Khan (1990) (as cited in Sowman, Fuggle & Preston, 1995) evidence of concern for the environment can be traced to the earliest history of South Africa in terms of the practices and lifestyles of indigenous people as well as the initial conservation efforts of early foreign settlers and public officials, which focused on the protection of wilderness and wildlife resources. Khan believes that environmental degradation in South Africa as well as the negative, alienated stance of the majority of South Africans towards environmental issues in the late 1980's and early 1990's can be linked to the policies and practices of the colonial and apartheid eras. Environmental challenges or problems have consequently been largely ignored in South Africa's apartheid era.

South Africa was, however, still influenced by international events such as the Stockholm conference in 1972 and the first World Wilderness Congress[3] was held in Johannesburg in

---

[1] The concept refers to the "morals" of a company, which influence objectives or visions and consequently the selection of production methods, processes etc
[2] It refers to legal compliance; thus the way in which a company must ensure that its products, processes and operations conform to the prescribed norms and standards
[3] The aim of the World Wilderness Congress was/is to provide an international platform for the understanding and preservation of wild and natural areas.

1977. In 1982 the Environmental Conservation Act 100 was promulgated, which was mainly concerned with the coordination of environmental matters and contained limited provisions to regulate activities and/or decisions that might be harmful to the environment. This act led to the establishment of the Council for the Environment in 1983. The International Community exerted pressure on South Africa to introduce Environmental Impact Assessment (EIA) as a legal mechanism for regulating activities that might have an effect on the environment (Third World Wilderness Congress, Findhorn, Scotland, 1983).

In 1989 the new Environmental Conservation Act (Act 73 of 1989) replaced Act 100 of 1982. This act provided for the determination of environmental policy to guide decision-making and provisions existed to regulate activities that might have a detrimental impact on the environment. In the case of regulated activities EIAs had to be prepared. The Department of Environmental Affairs promoted Integrated Environmental Management[4] in 1992 by publishing a series of guideline documents and checklists (Sowman, Fuggle & Preston, 1995).

According to Horberry and Kennedy (as cited in Sowman, Fuggle & Preston, 1995) the key constraints for the development of environmental evaluation procedures in South Africa were:

- Absence of a general environmental policy
- Lack of political will and awareness of the need to consider environmental issues
- An authoritarian system of government
- Lack of accountability by decision-makers
- Inadequate public participation
- Inefficient administrative structures
- Lack of popular support for environmental issues
- Legislative inadequacies

1.3.2 Post-Apartheid Era

The political transformation from apartheid to democratic government has resulted in wide-ranging reviews of policy across sectors. The constitution that was accepted on 8 May 1996 and amended on 11 October 1996 is seen as the cornerstone of environmental law in the new South Africa (Sampson, 2001). The constitution recognises that all citizens have a right to an environment that is not harmful to their health or wellbeing and entrenches the notion of sustainable development and its supporting principles (Section 24). According to Sampson (2001) the constitution contains many other rights of relevance to the environment:

- The right to sufficient water (Section 27)
- Access to information (Section 32),

---

[4] "IEM provides an integrated approached for environmental assessment, management, decision-making and to promote sustainable development and the equitable use of resources." DEAT, 1998.

- Just administrative action (Section 33)
- Limitation of rights (Section 36)
- The application of rights (Section 8)
- The application of international and foreign law (Sections 39 and 233)

Figure 1.4 depicts the pyramid of sustainable development in terms of environmental law in South Africa.
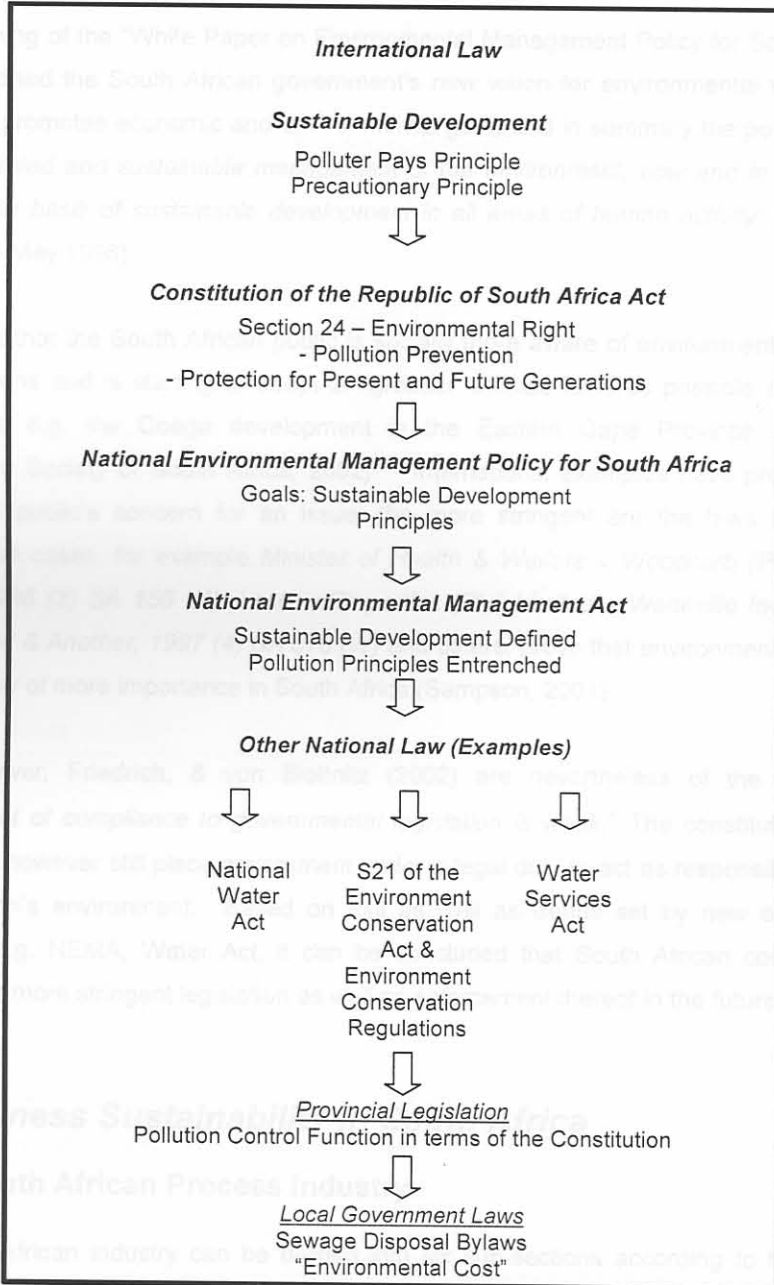
International Law

Sustainable Development
Polluter Pays Principle
Precautionary Principle

⇩

Constitution of the Republic of South Africa Act
Section 24 – Environmental Right
- Pollution Prevention
- Protection for Present and Future Generations

⇩

National Environmental Management Policy for South Africa
Goals: Sustainable Development
Principles

⇩

National Environmental Management Act
Sustainable Development Defined
Pollution Principles Entrenched

⇩

Other National Law (Examples)

⇩   ⇩   ⇩

National   S21 of the   Water
Water   Environment   Services
Act   Conservation   Act
   Act &
   Environment
   Conservation
   Regulations

⇩

Provincial Legislation
Pollution Control Function in terms of the Constitution

⇩

Local Government Laws
Sewage Disposal Bylaws
"Environmental Cost"

Figure 1.4: Sustainable development pyramid

Source: Sampson, 2001.

Environmental policies and legislation have developed and improved rapidly in South Africa during the past decade and are comparable to those of developed countries. The new water act as well as the new National Environmental Management act (NEMA) can be described as very progressive, particularly the provision for public participation (Government Gazette, 8 August 2002). Certain legislation, however, is out of date and is in the process of being revised, e.g. the Atmospheric Pollution Prevention Act of 1965 (Brent, Rohwer, Friedrich and von Blottnitz, 2002).

The publishing of the "White Paper on Environmental Management Policy for South Africa" in 1998 supported the South African government's new vision for environmental management. This policy promotes economic and environmental gains and in summary the policy emphasis that: "*integrated and sustainable management of the environment, now and in the future, is the essential basis of sustainable development in all areas of human activity*" (Government Gazette, 15 May 1998).

It is evident that the South African public is socially more aware of environmental impacts of human actions and is starting to adopt a 'greener' attitude towards possible developments and trends, e.g. the Coega development in the Eastern Cape Province (Wildlife and Environment Society of South Africa, 2002). International examples have proved that the greater the public's concern for an issue, the more stringent are the laws that develop. Recent court cases, for example *Minister of Health & Welfare v Woodcarb (Pty) Limited & Another, 1996 (3) SA 155 (N), Lascon Properties (Pty) Limited v Wadeville Investment Co. (Pty) Limited & Another, 1997 (4) SA 578 (W)* and others, prove that environmental issues are certainly now of more importance in South Africa (Sampson, 2001).

Brent, Rohwer, Friedrich, & von Blottnitz (2002) are nevertheless of the opinion that "*enforcement of compliance to governmental legislation is weak.*" The constitution of South Africa does however still place government under a legal duty to act as responsible custodian of the nation's environment. Based on this as well as trends set by new environmental legislation e.g. NEMA, Water Act, it can be concluded that South African companies can expect even more stringent legislation as well as enforcement thereof in the future.

1.4 Business Sustainability in South Africa

1.4.1 South African Process Industry

The South African industry can be divided into six sub-sections according to the Standard Industrial Classification of all Economic Activities (SIC), Fifth Edition used by the South African Statistical Services: Agriculture, forestry and fishing; Mining and quarrying; Manufacturing; Electricity and Water; Construction and Tertiary Sector. The SIC is based on

11

the third revision of the International Standard Industrial Classification of all Economic Activities (ISIC), with suitable adaptations for local conditions.

The process industry, which is the focus of this document, forms part of the manufacturing sector and can be defined as the primary manufacturer or the first step in the supply chain where value is added to raw material (see Figure 1.5). The focus of the process industry is on the manufacturing of materials that can be used in the manufacturing of products and it hence forms the first part of the secondary industry sector.
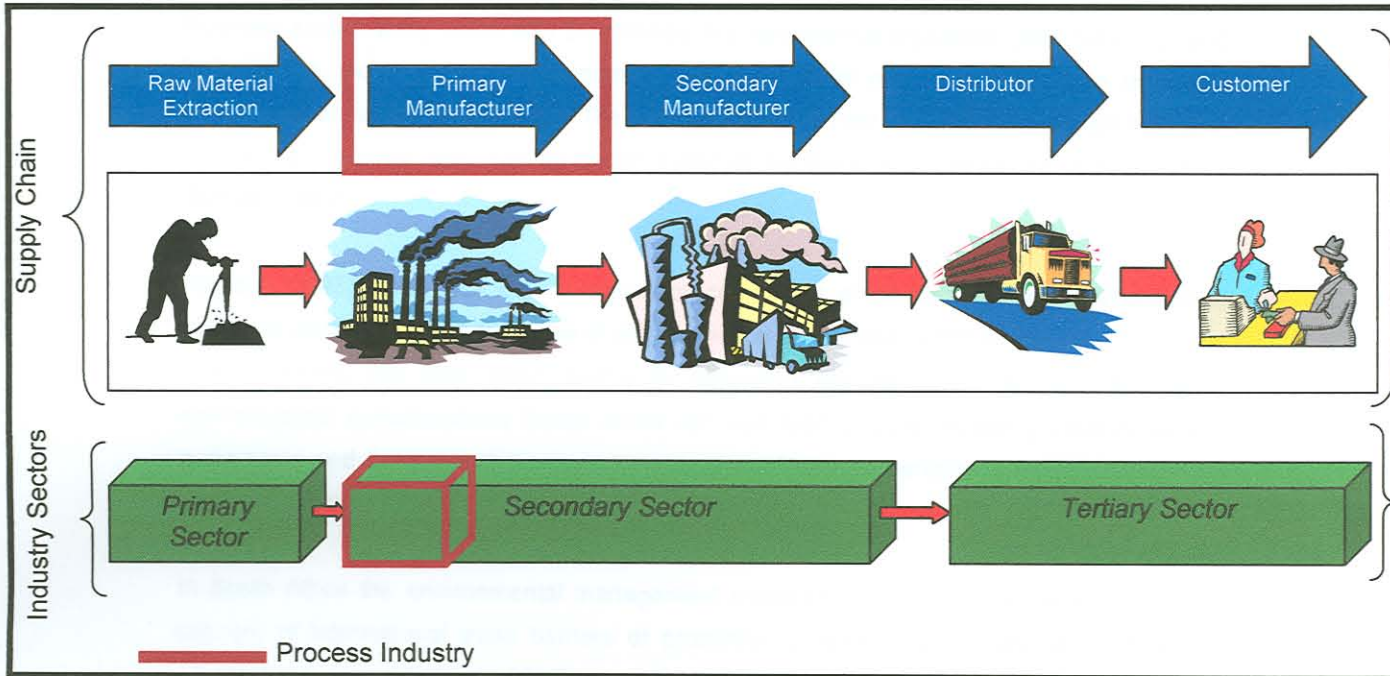
Figure 1.5: The process industry as part of the supply chain

The political transition from apartheid to a democratic government in South Africa also affected the process industry. During the apartheid regime most policies were strongly focused on national self-sufficiency and due to economic sanctions during the latter half of the 1980's many industries were protected through economic incentive schemes (Brent, Rohwer, Friedrich and von Blottnitz, 2002). In the energy sector for example, the apartheid government invested considerable sums of public resources into large-scale energy supply infrastructure such as SASOL, MOSGAS, the Koeberg Nuclear power station and others. These massive investments occurred over a period of more than thirty years; in the same period a complex regulatory system was put in place to protect these energy supply infrastructures and enormous subsidies and levies were granted to the industry (Van Horen 1996).

The manufacturing sector has been dominated by heavy industries relating to petroleum, chemical and metallurgical products prior to 1990, but in 2001 less than 4% of the total Gross Domestic Product (GDP) of South Africa was attributable to the chemicals manufacturing industry (Brent, Rohwer, Friedrich and von Blottnitz, 2002). With the political transition of the

early 1990's new forces manifested themselves at policy level in the form of global market opportunities and companies had to come to terms with the reality of South Africa again being part of the international community. In order to survive, companies had to make the mind shift at policy level from national self-sufficiency to global competitiveness. "Green" issues are of greater concern internationally and a pre-requisite for global competitiveness is an environmental friendly image and therefore all concepts of business sustainability apply to the South African process industry.

1.4.2 State of Business Sustainability in South Africa

Business sustainability starts with compliance to environmental legislation (see Table 1.2) and typically the more dependent a company is on natural resources the more important environmental valuation becomes. The ethos of "develop now, minimize associated cost and, if forced to, clean up later" can no longer dominate the thinking of companies in South Africa (Barrow, 1997).

Blignaut (1995) postulates that countries or companies place self-imposed environmental sanctions on its exports if the issue of environmental awareness is not addressed. Sampson (2001) echoes this idea when saying by accepting and falling in line with first world environmental considerations South Africa can sell itself globally as being environmentally sustainable and thus exploit the investment opportunities and benefits of being regarded as environmentally conscious.

In South Africa the environmental management practices of most companies are driven by concern of international trade barriers or promotion by parent companies (Brent, Rohwer, Friedrich, & von Blottnitz, 2002). A survey conducted by KPMG and the Industrial Environmental Forum (IEF) also identified international trade as one of the four drivers that are setting the pace of environmental transformation in South African industry, the other three drivers are customer demands, public opinion and government policy and legislation (Visser, April 2002).

South African companies will therefore have to adapt to changing times by introducing the ethic of sustainable living into their corporate culture, policies, goals and philosophies. The Southern African Nature Foundation (SANF) and the IUCN published a strategy for sustainable living in South Africa in 1993 in which it states that companies can adapt their culture, policies, goals and philosophies as well as contribute to sustainable living by:

- *"adopting sound practices, from the planning stage through to realization, that avoid environmental damage; monitoring all impacts and consulting with local communities and the public at large;*
- *introducing processes that use minimum quantities of raw materials and energy, reduce waste and prevent pollution; and*

13

- producing "environmentally-friendly" goods which have a minimum negative impact on human communities and the Earth" (Yeld, 1993).

Sustainability principles can only manifest themselves within the company if the decision-making processes of companies incorporate sustainability objectives. A few international companies in South Africa are making the sustainable development mind shift and is starting to report on their sustainability. This new paradigm is nonetheless not part of general business culture yet.

1.5 Aim of the dissertation

This dissertation focus on the first suggestion of the SANF and IUCN namely "adopting sound practices, from the planning stage through to realization, that avoid environmental damage; monitoring all impacts and consulting with local communities and the public at large" Sound practices can only be adopted if the methods used to implement these practices integrates and evaluates every aspects of environmental sustainable development objectives within its decision-making processes. Within this context, the aim of the dissertation is to develop a decision-making framework for projects in the process industry that incorporates environmental sustainability criteria.

1.6 Layout of document

The layout of the rest of the document is shown in Figure 1.6.
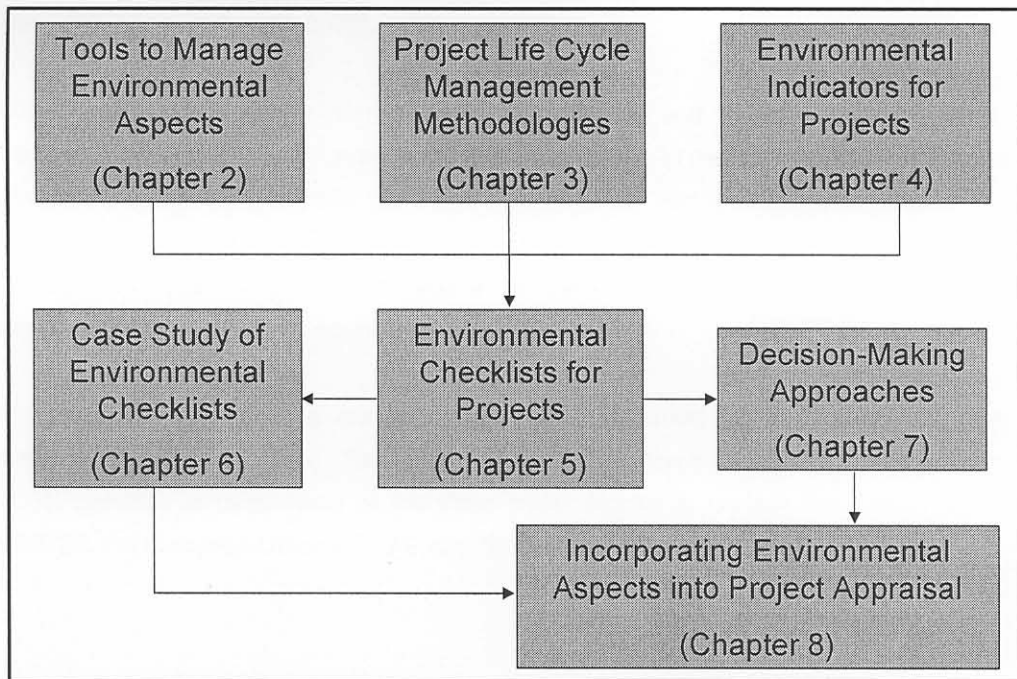

Figure 1.6: Layout of document

1.7 Conclusion

In the last few decades of the twentieth century man's attitude towards and view of the environment have changed dramatically. Economists and ecologists widely believe that the current environmental problems are the results of the social and economic paradigms that existed in society since the eighteenth century. Man has finally realised that the greatest threat is no longer from the armed forces of other nations, but in the massive and accelerating decline of the global environment (Caldwell, 1989). The international community has reacted to these environmental problems and a guaranteed environmental right has been written into the constitutions of at least 54 countries (Winstanley, 1995).

South African companies are facing the new challenges and emerging opportunities due to new international environmental laws, changing policies and globalisation. In order to do so the decision-making processes within companies must integrate and evaluate every aspect of environmental sustainable development.

The dissertation investigates the environmental pillar of sustainable development and proposes a decision-making framework for projects that incorporate environmental sustainability criteria.