

**IMPLEMENTATION OF AN ENVIRONMENTAL MANAGEMENT SYSTEM AT THE
MAFIKENG CAMPUS OF THE NORTH-WEST UNIVERSITY**

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ABSTRACT

The ISO 14001 Environmental Management System (EMS) standard is a wide-spread administrative tool in the field of corporate responses to sustainability. Knowledge about implementation of EMS based on ISO 14001 in South African universities is rather limited. The objectives of this study were to determine whether management believe the implementation of the EMS should take place at the Mafikeng campus of the North-West University; if so what the nature of the EMS should be; and what the barriers that may deter EMS introduction and/or implementation are.

A brief overview of the concept of sustainable development and dynamics involved in implementing Environmental Management Systems is presented.

The research approach was qualitative whereby semi-structured interviews and field notes were used to collect the data. The findings revealed that there is a need to implement an EMS at the Mafikeng campus. A number of recommendations are thus provided.

ACKNOWLEDGEMENTS

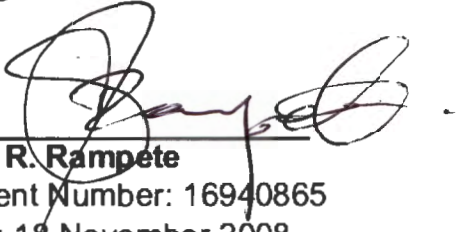
I wish to express my sincere gratitude to my creator and ancestors for giving me the tenacity and wisdom to work on this study. Furthermore, I acknowledge my indebtedness to the following people for their assistance with this mini-dissertation:

- (1) Professor P. L. S. Ackermann, my supervisor, for his patience, invaluable guidance and support.
- (2) Participants in the study; especially the management of the Mafikeng campus of the North-West University.
- (3) Family, friends and colleagues for their support and care.

DECLARATION

I hereby declare that this dissertation is my own work; has not been previously submitted for the purpose of a degree at any institution; and that all the sources I have or quoted have been duly acknowledged and indicated by means of complete references.

Furthermore, that the informed consent by the Rector of the Mafikeng Campus of the North West University to conduct the study at the Mafikeng Campus of the North West University was granted.

A handwritten signature in dark ink, appearing to read 'L. S. R. Rampete', is written over a horizontal line.

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1.1 Introduction

Universities are analogous to small cities with activities as diverse as the operation of research laboratories, agricultural research, hazardous waste and trash disposal facilities amongst others. Their innumerable activities have subjected them to having to grapple a wide range of environmental, health and safety issues to protect their communities and comply with the law. Environmental practices also differ across departments and, as a result, a new environmental governance challenge of coordination of these practices is created (Colleges and Universities Environmental Management System Guide, 2004).

This phenomenon is a reality in South Africa countrywide whereby the complexities of natural resource management and fragmented institutional landscape complicate efforts to develop effective institutions for environmental governance (Müller, 2006:45). As the country experienced increased economic activity it also, in retrospect, experienced continued growth in waste outputs and present challenges for sustainable resource management. This relationship between economic activity and waste output generation is supported in the study of Meyers, McLeod and Anbarci (2006:505).

Another challenge arises from energy production. According to Eder (2001:322), despite the fact that some countries are experiencing energy consumption at a slower rate than economic growth, the problem arises from the fact that energy production is mostly based on fossil fuels and therefore threatens to cause changes in climate due to the toxins released into the atmosphere.

The 'waste problem' has environmental, economic and social implications which are rapidly increasing. The implications have gained recognition over recent decades and the need for a response to the waste management problem and promotion of sustainable development thinking on an international scale has long been accepted. At the 1992 UN Conference on Environment and Development (UNCED) in Rio de Janeiro Brazil, the international community adopted the Rio declaration on Environment and Development

and Agenda 21, an action plan designed to guide the Earth's development in a sustainable manner (Meyers *et al.*, 2006:508).

Governments also promulgated increased stringent legislative and regulatory measures globally to compel institutions to raise environmental standards of business practices. Savely, Carson and Delclos (2007:669) indicate that research and academic institutions abroad are struggling to comply with this increase in environmental legislation. However, Meyers *et al.* (2006:511) state that most organisations have since undertaken initiatives to reduce their environmental impacts with some having improved their environmental performance by establishing environment management policies and systems. According to Dewar and Shippey (2002:326), the South African Government is a signatory to the Rio declaration and commits itself to making sustainable development a reality and ensuring the welfare of the people in this generation and in future generations.

A study by Ambe (2007:60) indicates that such initiatives have led international organisations to increase the use of soft law instruments, such as the ISO 14001. Soft law is identified as an important category of international law because it tends to indicate the likely direction of future formally binding obligations by informally establishing agreements regarding behaviour and by codifying practice. The ISO 14001 environmental management system (EMS) is standardised to the ISO 14001 standard and is privately run by the International Organisation for Standardisation (ISO). The ISO 14001 EMS is aimed at assisting organisations to systematically manage the environmental effects of their activities and does not substitute national environmental law. The system includes specific organisational measures to avoid pollution and damages of the environment and intends to improve the environmental performance of an organisation. It forces participating organisations not only to implement particular measures (like environmental policy, aims and program), but compels them also to carry out periodical internal checks and external audits by independent auditors (Freimann and Walther, 2002:2).

On 1 January 2004, the former University of the North-West (UNW), the Potchefstroom University for Christian Higher Education (PU for CHE) and the former Sebokeng Campus of the Vista University (VISTA) merged to form a new institution: the North-West University (NWU). However, these campuses operate as business units with specific programmes (<http://www.nwu.ac.za>, 2007).

As an academic institution, NWU is driven by values contained in the South African Constitution (Act 106 of 1996). The Constitution of the Republic of South Africa guarantees basic human rights and provides guiding principles for society. Thus, NWU respects all perspectives and belief systems, in order to ensure an environment for education, learning, research and community service.

The institution believes that quality assurance and measurement should form the basis of all academic and managerial activities. As a result, the NWU developed the Institutional Quality Management System aimed at achieving, maintaining, monitoring and promoting quality in all academic and support functions (Institutional Quality Management Policy of North-West University, 2007).

Furthermore, NWU in fostering a culture of continuous improvement and ongoing quality enhancement, formulated the Quality Policy to guide the development and implementation of an Institutional Quality Management System. This was done in support of the NWU vision, namely *“to be a pre-eminent university in Africa, driven by the pursuit of knowledge and innovation”*.

1.2 Objectives of the study

The Mafikeng campus of the North-West University, currently in a development stage resultant from its merger with other campuses (PU for CHE and VISTA), needs to re-examine fundamentally its primary activities and manage its operations in new and novel ways that challenge conventional thinking on business, education and the environment.

The overarching aim of the research was to investigate the need for implementation of an EMS at the Mafikeng campus of the North-West University.

The specific objectives of the research are to determine:

1. whether the management of the Mafikeng campus of the North-West University believe that introducing a formal EMS would promote sustainable development;
2. the nature of the EMS to be implemented;

3. determine the possible barriers that may deter efforts to an EMS introduction.

1.3 Importance of the study

Due to the need to address environmental challenges faced globally, Bansal and Gao (2006) indicate that, a number of studies have been carried out on organisations and environment focusing on environmental outcomes. Jones and Levy (2007) stated that physical impacts of climate change, such as rising sea levels and more frequent and intense storms have caused the business community to adopt a more constructive stance that acknowledges the reality and a responsibility for addressing the issue. Furthermore, the study stipulated that business, considered in their study as the network which orders and regulates economic activity and its impacts, has become a key part of the fabric of global environmental governance. This view was shared by Hansen and Lehmann (2006) who in addition raised the increased importance of market dynamics and economic agents as carriers of ecological reforms, and identified universities as being pivotal in playing a central role in such global efforts. The study stated that modes of operation are still deficient, but “universities as development hubs” was suggested as a concept to study further and modify the needs.

The ISO 14000 series of standards was released in September 1996 (Rondinelli and Vastag (2000); Zutshi and Sohal (2004)). According to MacDonald (2005), ISO 14000 comprises of the ISO 14001 Environmental Management System (EMS) standard. The ISO 14001 EMS standard is, according to MacDonald (2005), commonly used as an administrative tool in the field of corporate responses to sustainability. The findings by Kirkland and Thompson (1999) state that though some of the workbooks on implementing the standard offer some practical guidance on mechanical steps of introducing specific EMS components (for example, a list of common techniques for conducting an environmental review of a company). Like many other publications published before, they do not deal with many of the implementation issues that may be encountered. Instead, they tend to be more inclined on focusing on structural elements of an EMS and do not include much practical guidance. The study reveals that the phenomenon may be attributed to the fact that it is easier to develop a model of a system from a structural perspective than from a more comprehensive perspective where elements such as human psychology and organisational dynamics are taken into account.

In their study Brouwer and van Koppen (2008) confirm Kirkland and Thompson's findings and indicate that despite the existence of a vast number of handbooks and brochures for implementing and auditing the ISO 14001 standard, their findings are not as bright as the perspectives usually pictured in brochures and on internet sites. Instead, most of those studies review and evaluate the standard from a more scientific point of view. Moreover, loss of commitment to an EMS during its design and implementation is, according to Kirkland and Thompson (1999), a common occurrence.

Sammalisto and Brorson (2008) state that knowledge about implementation and certification of EMS based on ISO 14001 at universities is rather limited. Despite this limitation, Dewar and Shippey (2002) blame the South African universities for the lack of responsiveness of their curricula which are still rather conservative and not able to respond adequately to current social, economic, cultural and environmental issues. Thus, these institutions fail to produce graduates who shall advance the agenda of sustainable development.

Based on the above, the present study is important because it will offer practical guidance on EMS implementation issues that may be encountered in the context of the higher education sector, specifically the Mafikeng campus of the North-West University. The EMS implementation shall be consistent with promoting the sustainable development agenda.

1.4 Delimitations

The study confines itself within the Mafikeng campus of the North-West University in the North West Province, South Africa. The guidelines in this study shall be consistent with the provisions of the ISO 14001 standard and other related environmental literature.

1.5 Clarification of concepts

The international standard ISO 14001 makes reference to the following concepts and definitions and these shall apply for the purpose of the study to avoid possible confusion:

1. **Auditor:** person with the competence to conduct an audit.
2. **Document:** information and its supporting media. The medium can be paper, magnetic, electronic or optical computer disc, photograph or master sample or a combination thereof.
3. **Environment:** surroundings in which an organisation operates, including air, water, land, natural resources, flora, fauna, humans and their interrelations.
4. **Environmental aspect:** element of an organisation's activities or products or services that can interact with the environment. A significant environmental aspect has or can have a significant environmental impact.
5. **Environmental impact:** any change to the environment, whether adverse or beneficial, wholly or partially resulting from an organisation's aspects.
6. **Environmental management system audit:** systematic, independent and documented process for obtaining audit evidence and evaluating it objectively to determine the extent to which the environmental management system audit criteria set by the organisation are fulfilled.
7. **Environmental objective:** overall environmental goal, consistent with the environmental policy that an organisation sets itself to achieve.
8. **Environmental performance:** measurable results of an organisation's management of its environment.
9. **Environmental policy:** overall intentions and direction of an organisation related to its environmental performance as formally expressed by top management. The environmental policy provides a framework for action and for the setting of environmental objectives and environmental targets.
10. **Environmental target:** detailed performance requirement applicable to the organisation or parts thereof, that arises from the environmental objectives and that needs to be set and met in order to achieve those objectives
11. **Procedure:** specified way to carry out an activity or a process. Procedure can be documented or not.
12. **Record:** document stating results achieved or providing evidence of activities performed.

1.6 Plan of the study

The following chapter provides a theoretical foundation of the study and a critical review of the various theories that have a bearing on the problem. The problem statement and research questions are presented in chapter 3. The approach followed in conducting the research; sampling methods applied; measuring instruments used; and data analysis are presented in chapter 4. Chapter 5 provides the results of the study. Finally, chapter 6 provides a discussion, conclusion and recommendations of the study.

2.1 Introduction

With the history of the changing environment alongside the history of humanity it is essential to highlight that human life is impossible in an ailing environment. To humans, the environment is more than physical and includes the cultural, religious and ethical aspects of their world and calls for sustainable practices with emphasis placed on intergenerational equity (Field, 2006:414). The study by Field (2006:417) views sustainable development as a problem solving technique employing an algorithmic process with three parameters (the three E's - namely: environment, economy and equity). Moreover, the process is employed across a geographical dimension (requiring 'that sustainable development solutions span from local to global approaches with no "one size fits all" mentality'). Furthermore, the processes is also employed across a time dimension (requiring the optimisation of sustainable development solutions 'in both the short-term intragenerational [relationship between all people in the present] scale and the long-term intergenerational scale [relationship between the people of the present and of the future]').

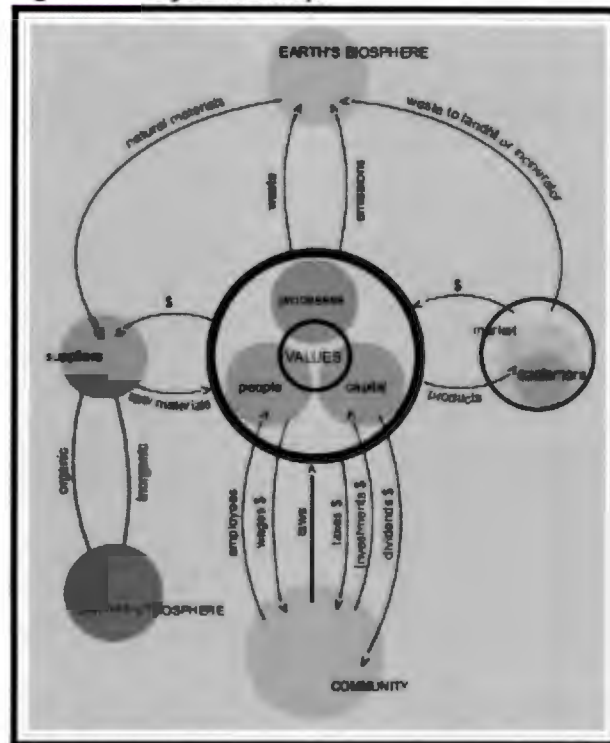
Field (2006) further states that intergenerational equity requires preserving natural resources for the benefit of future generations; sustainable use requires exploiting natural resources in a manner that is sustainable, prudent, rational, wise or appropriate; the equitable use of natural resources requires states equitably to take into account the needs of other states; and integration requires that environmental considerations are integrated into economic and other development plans, programmes and projects, while development needs are considered in applying environmental objectives.

Figure 2.1 shows the earth's systems with linkages between human social and economic systems and environmental systems. MacDonald (2005:633) refers to the requirements of intergenerational equity as the System Conditions for social sustainability. Moreover, MacDonald (2005) reveals the attribute of the Systems Conditions, namely: in a sustainable society, nature is not subject to systematically increasing:

1. concentrations of substances extracted from the Earth's crust;
2. concentrations of substances produced by society;

3. degradation by physical means and, in that society; and
4. people are not subject to conditions that systematically undermine their capacity to meet their needs.

Figure 2.1: Systems Map.



Adopted from MacDonald, 2005. pp. 639

Sustainable development defines all social problems in terms of the environment, economy and equity and optimises (projects) all three parameters in both the geographic and time dimension (Ruhl cited by Field, 2006:417). As an example, the physical impacts of climate change, such as rising sea levels and more frequent and intense storms have caused the business community to engage in environmental management practices and to adopt a more constructive stance that acknowledges the reality and its responsibility for addressing the issue (Jones and Levy, 2007:428-429).

In the study by Alshuwaikhat and Abubakar (2008:1777) a sustainable university is defined as a higher educational institution, as a whole or as a part, that addresses, involves and promotes, on a regional or a global level, the minimization of negative environmental, economic, societal, and health effects generated in the use of their resources in order to fulfill its functions of teaching, research, outreach and partnership, and stewardship in ways to help society make the transition to sustainable lifestyles. The study further defines

a sustainable campus community as the one that acts upon its local and global responsibilities to protect and enhance the health and well-being of humans and ecosystems. It actively engages the knowledge of the university community to address the ecological and social challenges that we face now and in the future.

According to Ryan (2003:256-260), the past decades culminated into partnership notions which permeated the many expressions of, and pronouncements on, ecological sustainability. The 1992 United Nations Conference on Environment and Development (the Earth Summit) resulted in an action-oriented formulation of sustainability partnerships (Sps). The values upon which the Sps are founded must be consistent with the ethical dimensions of classical business partnerships, namely: honesty; fairness; openness; mutual care, and utmost trust. Furthermore, Ryan (2003) states that "the integration of environmental perspectives into sustainable development and economic globalisation agendas has been emphasised as crucial."

Khan, Raveender and Husain (2002:456) thus define Environmental Management as "the integrative, technological, ecological, cultural, economic and social process by which the environment is developed in a holistic and systematic manner through the optimal use of existing and potential resources in the biosphere, for the ultimate improvement of human well-being". According to the authors, sustainability is an operational concept describing the actions of those involved in decision-making and it makes a deliberate and systematic attempt to understand how their activities affect the environment and how their concerns about environment will affect their activities. Moreover, Environmental Management is a positive concept, not a negative "halt progress" or "back to nature" concept. It is a key administrative process with decision-making functions that uses a wide range of social, economic and technical methods to implement societal goals (Khan *et al.*, 2002:456) .

In their study, Pretty and Ward (2001:209), Gardiner, Rubbens and Bonfiglioli (2003:68) and Hansen and Lehmann (2006:820) agree that, in pursuit of sustainable development, social cohesion and social development are no longer seen as the sole responsibility of governments. Also, they acknowledge that actors from civil society and the private sector are also becoming actively involved and engage in partnerships in an endeavour to promote the greening of industry. They further indicated that the past decade has seen an emergence of partnerships due to the development of social institutions and power

relations through mutual trust, reciprocity and commitment to agreed norms and rules for behaviour.

In other words, there has been a substantial shift towards the social capital and these possess four central aspects, namely: relations of trust; reciprocity and exchanges; common rules, norms and sanctions; connectedness, networks and groups. These partnerships have been a pivotal mechanism of reinforcing the shift in regulatory regimes that have been going on for more than a decade. The past decade has thus seen a growing recognition of the effectiveness of social institutions for sustainable environmental and economic outcomes (Hansen and Lehmann, 2006:820).

Field (2006:416) shares the view that sustainable development rests on a principle of transformation and requires a process of change that extends to 'the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change'.

Moreover, MacDonald (2006:634) indicates the sustainability objectives of an organisation as being to:



1. eliminate its contribution to systematic increases in concentrations of substances from the Earth's crust;
2. eliminate its contribution to systematic increases in concentrations of substances produced by society;
3. eliminate its contribution to systematic physical degradation of nature; and
4. eliminate its contribution to the undermining of humanity's ability to meet its needs worldwide.

In responding to the call for sustainable development, literature by Rondinelli and Vastag (2000:499), Bansal and Bogner (2002:271) and Zutshi and Sohal (2004:400) trace the release of the ISO 14000 series of standards or the International Standard for Environment back in the past decade, September 1996 to be specific, and state that that series comprises of two main parts:

1. specification with guidance for use; and
2. general guidelines or principles, systems and supporting techniques.

The International organisation for Standardisation (ISO) developed the ISO 14000 series of standards based on the need expressed at the United Nations Conference on Environment and Development (UNCED) in Rio de Janeiro in 1992 for improved environmental quality (Bansal and Bogner, 2002:271).

Despite the prevalence of negative criticism against standards-based systems, Tenbrunsel, Wade-Benzoni, Messick and Bazerman (2000:862) state in their study that "Standard-based systems provide guidelines that encourage optimal, healthy, and moral environmental decisions."

According to the (ISO, 1996), after being petitioned to consider developing environmental standards that shall be acceptable internationally, it established the Strategic Advisory Group on the Environment (SAGE) in 1991 to meet this requirement.

SAGE established the Technical Committee 207 (TC 207) with considerations of whether such standards would:

1. enhance an organisation's ability to attain and measure environmental performance;
2. promote a common approach to environmental management similar to quality management; and
3. facilitate lower trade barriers.

The mandate of TC 207 was to consider and produce final consensus standards for environmental management; and included a coordination and cooperation function with international and regional governmental bodies.

These standards had to reflect the following features (ISO, 1996):

1. guidelines with performance indicators;
2. performance orientation; and
3. objectivity, measurability, reliability, and user-friendliness.

To sum up, Azzonne and Noci (1998, 94) state that several factors explain the existence of concerns for “green” issues; among the others: the dramatic negative environmental impacts of the companies’ operations and products; the growing interest of public opinion, pressure groups and governmental institutions for the “quality” of the eco-system; and the executives’ appreciation of the (competitive and economic) benefits derived from the adoption of environmentally conscious programmes.

This chapter proceeds in five sections, beginning with the relationship of ISO 14000 series with other systems and standards; voluntary international frameworks; the South African legal framework; the ISO 14001 Environmental Management System; and the Environmental Management System pre-implementation considerations.

2.2 Relationship of ISO 14000 series with other systems and standards

According to Zutshi and Sohal (2004:335), within the ISO 14000 Series only ISO 14001 is the specification document, and the only one that organisations can certify themselves with. Other standards in the series such as ISO 14004, ISO 14011 and ISO 14012 are guiding documents, not mandatory for obtaining certification, nonetheless assist the organisations in satisfying the ISO 14001 criteria.

Like many ISO standards, ISO 14001 is voluntary—there are no legal requirements to certify. Also, ISO 14001 does not set performance standards. Instead, ISO 14001 focuses on management processes rather than specific environmental outcomes. If the firm meets the management system requirements dictated by the standard, then it can register its conformance with a third party. Either the entire organisation or specific facilities, such as manufacturing plants or operating facilities, can be certified (Bansal and Bogner, 2002:271).

2.3 Voluntary international frameworks

Brouwer and van Koppen (2008:452) highlight in their study that the ISO 14001 standard co-exists with several other voluntary international frameworks developed for measuring and comparing environmental performance of companies, namely:

1. Global Reporting Initiative (GRI): guidelines for sustainable reporting. It is used for reporting on economic, environmental, and social dimensions of activities, products, and services.
2. Social Accountability (SA 8000): based on workplace norms. It addresses eight categories of indicators, from human rights oriented to specific environmental categories of indicators.
3. World Business Council for Sustainable Development (WBCSD): a coalition of 170 international companies united by a shared commitment to sustainable development. It addresses three pillars: economic growth, ecological balance, and social progress.
4. The European environmental framework of the European Environmental Agency (EEA): environmental indicators to measure, communicate, and analyse sustainable development.
5. EMAS (since 2001, EMAS II): It addresses three categories of environmental performance indicators, namely: operational performance indicators; management performance indicators; and environmental condition indicators.

Looking from another perspective, of the higher education sector, Herremans and Allwright (2000:169) and Hansen and Lehmann (2006:820) indicate that capacity building for sustainable development has been a targeted activity over the last decade through university and university consortia networking. Universities from Africa (Botswana and South Africa), Asia (Malaysia and Thailand), Central America (Costa Rica, El Salvador and Nicaragua) and Europe (Denmark) participated with graduate students and faculty, hence an emergence of several declarations aimed at providing universities with direction in determining their role toward an ecologically responsible future, namely: Talloires declaration (1990); Halifax declaration (1991) and Swansea declaration (1993). According to Alshuwaikhat and Abubakar (2008:1777), the Stockholm Declaration of 1972 was the first to make reference to sustainability in higher education and has recognized the interdependency between the humanity and the environment and suggests several ways of achieving environmental sustainability. While some programmes emphasised research and others higher education, eventually a blend of research and higher education was found to be more productive.

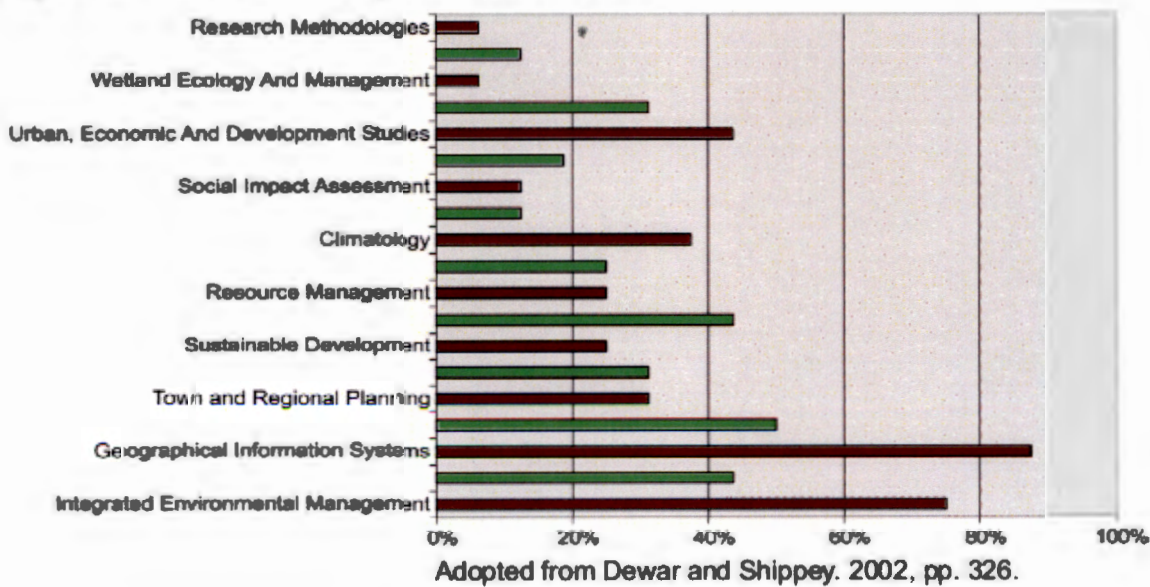
The recommendation resulting from the declarations notwithstanding, Dewar and Shippey

(2002:333) are of the opinion that university curricula are often still rather conservative and not able to respond adequately to current social, economic, cultural and environmental issues.

An analysis was undertaken of all universities in South Africa, by Dewar and Shippey (2002 : 326), that included the word “environment” in the title of their postgraduate degrees. Figure 2.2 illustrates the variability in the full range of courses relating to substantive environmental theory and management and the frequency with which they are offered in South African universities. The chart thus indicates that subjects of environmental impact assessment or management are included, to a very limited degree, in the curricula. The results from the analysis are disappointing since such subjects are essential to any degree programme with internal integrity or coherence in management (Dewar and Shippey, 2002:326). Furthermore, the results, according to Dewar and Shippey (2002:326), has “serious societal and environmental implications” and it is therefore imperative to ensure that graduates are of an appropriate standard are equipped with skills to help realise a sustainable future.

Coopey (2003:24) confirms that academic institutions of higher learning need to focus orientation of curricula to incorporating environmental issues in order to not only realise their goals, but also help reduce the degradation and possible destruction of the environment.

Figure 2.2: Environmental degrees – course content.



2.4 South African environmental legal framework

The New Delhi declaration, issued by the International Law Association (ILA), identifies 'general' and 'specific' principles as constituting the normative framework for sustainable development. The four general principles are: observance of the rule of law in international relations; the duty to co-operate towards global sustainable development; the observance of human rights; and the principle of integration. The specific principles encompass sovereignty over natural resources and the duty to protect both the domestic and trans-boundary environment; the sustainable use of natural resources; intergenerational equity; intra-generational equity; common but differentiated responsibility; recognition of the common heritage of humankind; the precautionary principle; public participation and access to information; and good governance and democratic accountability (Field, 2006:412-413).

The Constitution of the Republic of South Africa, Act 108 of 1996 is consistent with the provisions of The New Delhi declaration as it, amongst others, guarantees basic human rights and provides guiding principles for society. The Bill of Rights enshrined in the Constitution stipulates the environmental rights and states that everyone has the right:

1. to an environment that is not harmful to their health or well being; and
2. to have the environment protected, for the benefit of present and future generations, through reasonable legislative and other measures that:
 - 2.1 prevent pollution and ecological degradation;
 - 2.2 promote conservation; and
 - 2.3 secure ecologically sustainable development and use of natural resources while promoting justifiable economic and social development.

A number of initiatives were undertaken by the South African government in an endeavour to provide broad directives into promoting sustainable development. The promulgation of the Environmental Conservation Act (No. 73 of 1989) (ECA) and the National Environmental Management Act (No. 107 of 1998) (NEMA) affirm the themes of transformation, equity, the importance of 'seeing rightly' (through the principles affirming the precautionary and preventive principles), and the need for integration of economic,

environmental and social factors (Field, 2006:428). The ECA aims to help identify activities which may have a detrimental effect on the environment; while NEMA aims to improve the quality of environmental decision-making by setting out principles (refer to appendix 1) for environmental management that apply to all government departments and organisations that may affect the environment (NEMA). The thrust of NEMA is to protect the environment (Sampson, 2007:80).

NEMA also creates a framework for facilitating the role of civil society in environmental governance. This is evident from the study by Glazewski and Witbooi (2005:430) which, citing Regulations 3(1)(f) of R1183 Government Gazette 18261 of 5 September 1997 as amended, states that the common law *audi alteram* principle is complemented in the context of carrying out environmental impact assessments by regulations which (among other things) require that "all interested parties are given the opportunity to participate in all the relevant procedures contemplated in these regulations".

Sampson (2007:80) states that sustainable development acts as a balancing mechanism in determining development applications. According to Sampson (2007), the South African law requires the environmental authorities to ask, amongst others, two questions when determining whether to authorise a project or not, namely:



1. whether it is possible to mitigate the adverse environmental impacts satisfactorily, and,
2. whether any socio-economic benefit to the community would accrue as a result of the proposed project being undertaken. If these questions are answered in the affirmative, the project should be authorised, because a balance would have been struck between the need to protect the environment and ensuring community upliftment and development (Sampson, 2007:80).

According to Dewar and Shippey (2002:325) and Sampson (2007:80), it is not only the EIA authorities that are required to consider socio-economic issues, but every other authority that takes any decision which may have an adverse impact on the environment. This owes to the fact that the scale and extent of the activity or the nature of the environment in which it will be located is irrelevant. As long it is among the Listed Activities within the

Environmental Impact Assessment Regulations, promulgated under Section 21, 22, 26 and 28A of the ECA, it must be reported to the Department of Environmental Affairs and Tourism (DEAT). This is attributed to the fact that no criteria relating to the threshold of the activities or to the nature of the receiving environment have been issued alongside the schedule of Listed Activities. Furthermore, in case an activity is not in the schedule of Listed Activities, requiring some form of authorisation (by any authority whether local, provincial or national government) and capable of significantly affecting the Environment; then such an activity must first have an Environmental Impact Assessment (EIA) Report compiled and submitted to DEAT for approval.

Based on the above, Sampson (2007) identifies the Government, by co-operatively pooling all its resources, as the only entity that can truly assess the social, economic, and environmental impacts of various development activities in a particular region or area. This would allow its departments to determine the types of development that are suitable for an area. Moreover, this would allow potential investors to know in advance whether their particular industry will be allowed in a particular region or area. Any further EIA that is then required at a project level for a particular development could generally be limited to assessing the environmental impacts of the project itself.

Field (2006:428-434) establishes that the original statutory EIA regime in South Africa contextually does seem to be grounded in a sustainable development paradigm. According to Field (2006), the original statutory EIA regime acknowledges the three E's (rolling up equity and economy into the term 'socio-economic conditions') as well as the parameter of cultural heritage, and seems to recognise the possibility for conflicting constraints (mitigation of activities). However, it fails to recognise the dimensions of time and space. Field (2007) further states that "the formulation 'with a view to minimising negative impacts, maximising benefits' conveys the idea that one must attempt to maximise all three parameters rather than focusing only on environmental protection". The problem now arises with the current statutory EIA regime where amendments to Section 24 which altered EIAs to be more concerned with impacts on the natural environment only, and not with the complex interactions among the environment, equity, and the economy. However, the NEMA is unambiguous in requiring that development should be economically, socially and environmentally sustainable and that a consideration of these aspects must be integrated. These are principles that apply 'throughout the Republic to the actions of all

organs of state that may significantly affect the environment' (Field, 2006:434).

In conclusion, the principles require that development should be economically, socially and environmentally sustainable and that a consideration of these aspects be integrated and constrain decision making (Field, 2006:434).

2.5 ISO 14001 environmental management system

Khan *et al.* (2002:455) define an Environmental management as a set of actions based on a structured methodology to ensure that an organisation is committed to the environment and that the production process has minimal or no adverse effect on it. Perotto, Canziani, Marchesi and Butelli (2008:517-518) elaborate and refer to an EMS as a problem identification and problem-solving tool for managing the interaction between the organisation and the environment.

The ISO 14001 EMS is based on the concept of continual improvement, a process of enhancing the environmental management system in order to achieve improvements in overall environmental performance consistent with the organisation's environmental policy (ISO, 1996). MacDonald (2005:634) states that "organisations may implement the ISO 14001 standard to move them towards sustainability".

As stated earlier, continual improvement is at the heart of ISO 14001 and forms the basis of the "Plan, Do, Check, Act" (PDCA) cycle, see Figure 2.3; the engine of the environmental management system. Martin (1998:11) explains the PDCA cycle described by the following words in bold and states that **planning** is accomplished by setting an environmental **policy**, then making the environmental concerns of the firm clear (Aspects) and defining what will be done to control them (Objectives and Targets). **Implementation** begins when an organisational structure, personnel responsibilities, competency and training are established. The **operation** portion of the program is defined by the communication practices, documentation control and procedural documents, operational control and emergency preparedness. According to Martin (1998:11), these items are usually included in an EMS Manual, which documents a program to accomplish the Objectives and Targets set above. Furthermore, the organisation's methods for measuring

and monitoring its environmental impacts is also included in the Manual, along with practices for identifying non-conformance and for implementing corrective and preventive actions. Martin (1998:11) states that these, along with routine systems audits and record keeping constitute the EMS **checking and corrective action** program. And finally, the program has a routine **management review** of its activities. The **operation** portion of the program above describe the general sections of an ISO 14001 EMS and constitute the requirements of the standard.

Figure 2.3: The “Plan, Do, Check, Act” model.



Adopted from ISO 14001 Guidance Manual, 1998.

An EMS is part of an organisation's management system (Zutshi and Sohal, 2004:400). It aims to manage the environmental aspects related to its activities, products and services that can be implemented in an organisation in many different ways, depending on the sector of activity and the needs perceived by management (Perotto *et al.*, 2008:518).

Khan *et al.* (2002:457), MacDonald (2005:632) and Savely *et al.* (2007:650-651) reveal the essential elements of an environmental management system identified by studying the ISO 14001 standard and include:

1. a written environmental policy;
2. the identification of activities that may affect the environment (aspects);
3. the development of environmental programs with objectives and targets;
4. use of a procedure to identify legal requirements applicable to environmental issues;

5. assigning responsibilities for environmental matters to specific individuals;
6. reporting environmental performance issues (such as pollution load, damage indices, equity, economic efficiency, reduction in dependence and administrative cost) to top management on a routine basis;
7. training for individuals whose actions may have an impact on the environment;
8. maintaining documentation regarding internal and external communications about environmental matters;
9. creating a system to ensure that personnel are working with the most current versions of environmental procedures;
10. having environmental emergency preparedness and response procedures in place;
11. monitoring and measuring operations that could have an environmental impact;
12. having procedures in place to correct any environmental non-conformances;
13. having procedures in place to manage and store environmental records;
14. conducting routine internal audits of the environmental program;
15. conducting routine third party audits of the environmental program; and
16. holding a periodic review of the environmental program by upper institutional management.

Each clause was written to apply to a wide diversity of organisations, and is therefore not specific or prescriptive. The requirements describe general outcomes of the system, but do not prescribe specific approaches an organisation must implement to get there (MacDonald; 2005:632).

The following is a summary of the seventeen ISO 14001 clauses (1 ISO 14001,1996):

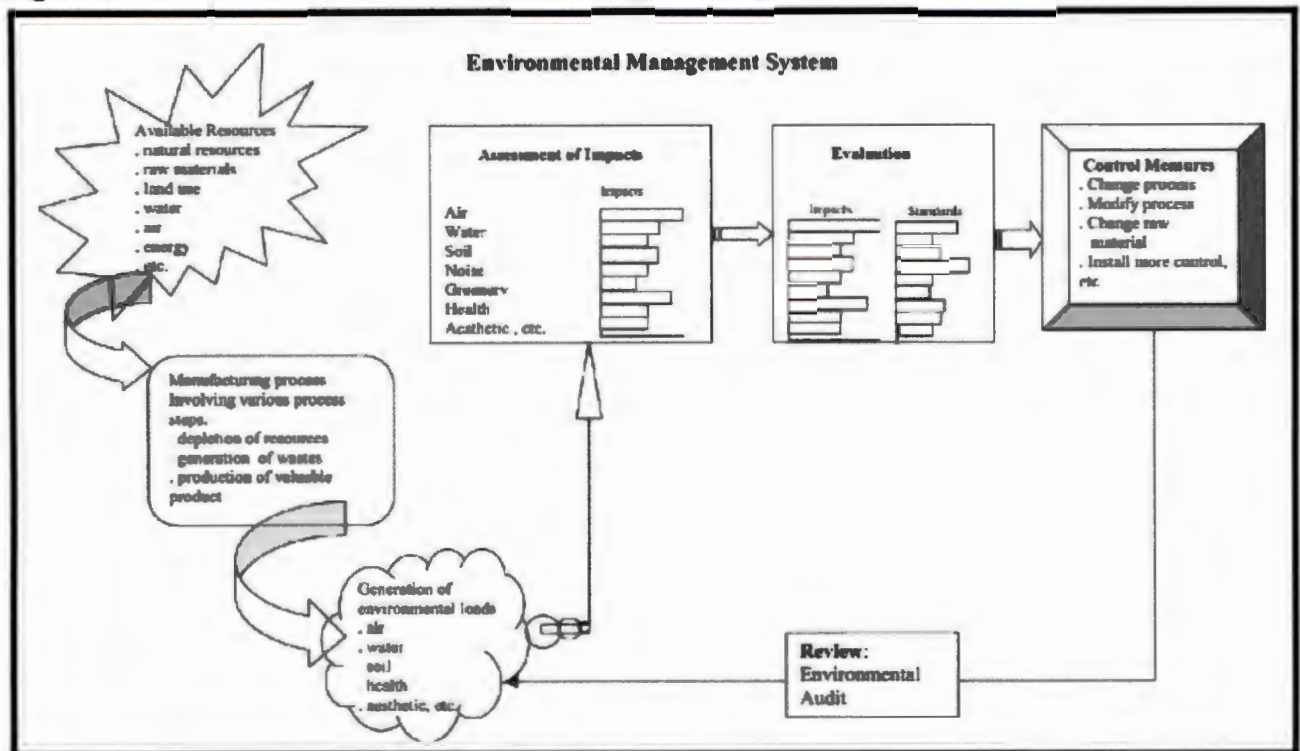
1. Environmental Policy
2. Planning
 - 2.1 Environmental aspects
 - 2.2 Legal and other requirements
 - 2.3 Objectives and targets
 - 2.4 Environmental management program(s)
3. Implementation and operation
 - 3.1 Structure and responsibility
 - 3.2 Training, awareness and competence

- 3.3 Communication
- 3.4 Environmental Management System Documentation
- 3.5 Document control
- 3.6 Operational control
- 3.7 Emergency preparedness and response
- 4. Checking and corrective action
 - 4.1 Monitoring and measurement
 - 4.2 Non-conformance and corrective and preventive action
 - 4.3 Records
 - 4.4 Environmental Management System audit
- 5. Management review

Khan *et al.* (2002:457) indicate that a proper environmental management system must provide continuous formulation and reformulation of social, economic and environmental actions as in a feedback process. A general overview of the EMS is depicted in Fig. 2.4. The study shows that there is a wide range of physical and technological options for maintaining and improving environmental quality at any given point (considering any development activity and its adverse impact) of the system. Furthermore, developing an EMS generally requires the following steps:

1. An analysis of the existing environmental situation and behaviour and interactions of the various components of the environment;
2. A study of the dynamics of the boundary conditions to yield an understanding of outer limits;
3. The setting of social, economic and environmental goals, and a definition of specific objectives by which to achieve them;
4. The formulation of a balanced programme considering the source of concern (the source of adverse impact) and the natural components of the environment;
5. Evaluating and ranking programs, for example, pollution load, damage indices, equity, economic efficiency, reduction in dependence and administrative costs amongst others; and
6. Promotion, guidance and supervision of such programs, which include continuous monitoring of the economic, ecological and social impacts (outputs) of the programs.

Figure 2.4: Overview of an Environmental Management System.



Adopted from Khan *et al.*, 2002. pp.457.

Despite the fact that standards-based systems have been subject to negative criticism by some authors of environmental literature, Tenbrunsel *et al.* (2000:862) show in their study that Standard-based systems provide guidelines that encourage optimal, healthy, and moral environmental decisions.

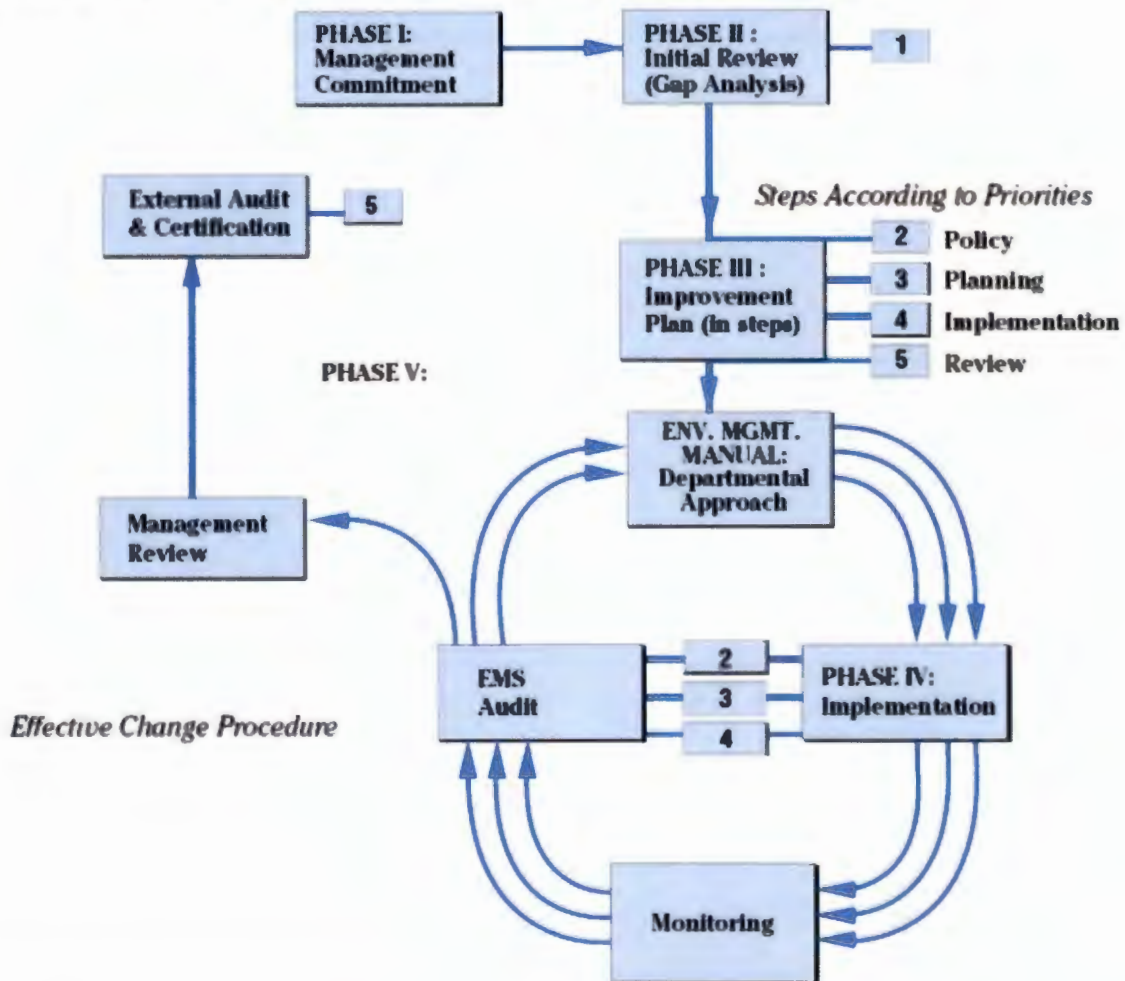
2.6 Environmental management system pre-implementation considerations

In ensuring successful implementation of an EMS there is a number of considerations that organisations must bear in mind. For this study, “successful” implementation has been defined as one being “smoother, faster, effective and sustainable” in nature.

Studies by Martin (1998) and Collier and Gillman (2003) propose a five-phased approach of implementing an EMS, as shown in Figure 2.5, based on the summary of the five essential elements above. The PDCA model, as explained above, informs the proposed five-phased approach of EMS implementation. However, this ISO ‘recipe’ (five-phased approach) does not describe techniques that may be used to blend the ingredients (elements) into a successful whole.

An essential requirement of the ISO 14001 EMS standard necessitates the establishment of an Environmental Policy mandated by top management and verified by them during Management Review (Martin, 1998:18).

Figure 2.5: A five-phased approach in implementing the ISO 14001 EMS.



Adopted from the National Center for Environmental Decision-making Research, 1998. pp. 14.

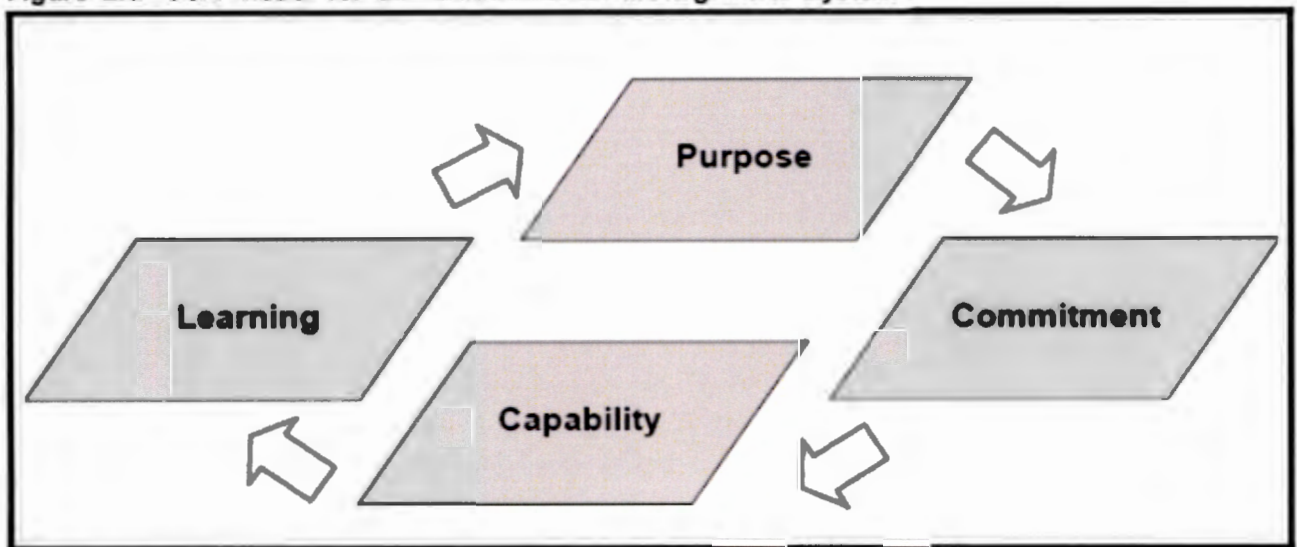
According to Martin (1998:18), the Environment Policy is the driving force behind environmental principles to which an organisation subscribes to and should thus:

1. Reflect the moral and ethical basis for the organisation's actions;
2. Account for regulatory/self-imposed requirements;
3. Stress commitment to continual improvement;
4. Provide coordination to other organizational policies;

5. Provide attachments to both internal and external requirements;
6. Be germane to the operation's products and services as they impact the environment;
7. Be clear, concise, and implemented at all levels of the Policy;
8. Be publicly available;
9. Strive toward prevention of and continual reduction of adverse environmental effects, thus supporting sustainable development;
10. set and allow for publication of environmental objectives and targets, improvement plans and management reviews;
11. Satisfy the requirements of concerned third parties such as insurance companies, banks, shareholders and so forth; and
12. Be updated and checked routinely.

Another EMS model, depicted in Figure 2.6, developed by the Canadian Standards Association in 1994, a member of the ISO committee, conveniently categorised these essential elements in to four, namely: purpose, commitment, capability and learning (Herremans and Allwright, 2000:170).

Figure 2.6: CSA model for an Environmental Management System.



Adopted from Herremans and Allwright, 2000, pp. 170.

- ***Purpose (Define Purpose/Establish Plan)***

The Purpose processes entail establishing control systems to fulfill environmental

objectives of an organisation and involve the following (Herremans and Allwright, 2000:170):

1. Development of the environmental policy statements, principles and guidelines;
2. Conducting risk assessment and evaluating reliability decisions; and
3. Evaluating and setting objectives objectives and targets.

- *Commitment (Establish Commitment)*

The commitment processes are aimed at ensuring goal congruence by motivating people to work toward the realisation of the organisation's environmental objectives rather than a personal objective that might be in conflict with those of the organisation and involve (Herremans and Allwright, 2000:171):

1. Establishing shared environmental values;
2. Creating cohesion through establishment of reward systems and equipping employees with the necessary skills; and
3. Providing responsibility and authority for environmental accountability.

- *Capability (Ensure Capability)*

The capacity processes involve setting environmental standards to help provide and enhance capability for the organisation's employees and offering the following (Herremans and Allwright, 2000:171):

1. Knowledge, skills and training;
2. Resources such as information, physical equipment and people; and
3. Information management and procedures pertaining to life cycle assessment and costing, environmental product impact assessment, and full cost accounting whereby external costs are internalised.

- *Learning (Evaluate, learn and improve)*

The learning processes are concerned with generating information to promote

organisational self-regulation and self correcting and involve the following (Herremans and Allwright, 2000:171):

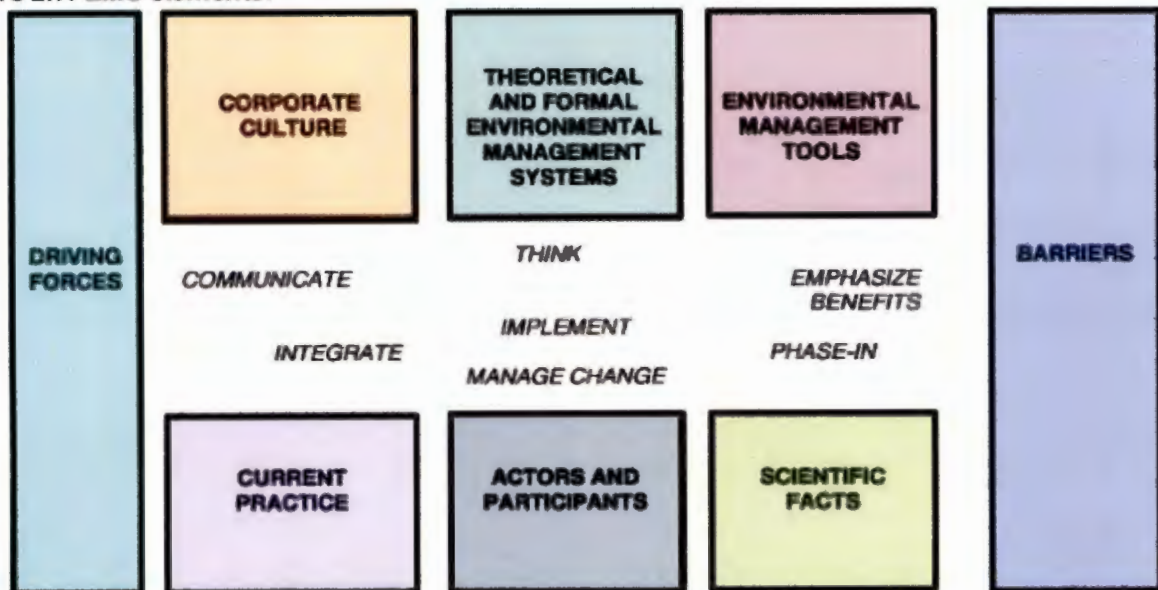
1. Measuring environmental performance using environmental indicators, and monitoring applying systems thinking;
2. Communication and reporting of environmental performance;
3. System audits and management review; and
4. Continuous improvement through self-assessments.

Unfortunately, the two approaches attempt to implement an EMS focusing on structural elements and do not include much practical guidance. They fail to address a number of aspects involved in EMS introduction, such as gaining initial commitment, and fail to address many of the implementation issues that may be encountered. Even though it is understandable that EMSs have been initially approached from a structural perspective. The basic components of a system must be identified before a system is put in place.

However, successful EMS introduction involves a wide range of challenges which cannot be met by a structural approach alone. One must go past structure to develop a successful EMS (Kirkland and Thompson, 1999:129). The model by Kirkland and Thompson (1999:130), shown in Figure 2.7, attempts to address the limitations in the models discussed above. Deviating from the traditional approach of focusing on the system elements or the clause based approach, it is more aligned to a modern approach. The modern approach takes on a business process approach, focusing on the business process; design the system around the business requirements (not the other way around); and using process mapping technique.

Before rolling out a strategy to implement an EMS it is reasonable to consider what the ideal implementation platform shall be; it may either be paper format or electronic format (electronic filing system or electronic EMS). Henriques and Sadorsky (1999:89) state that the formulation of an environmental plan is simply an outcome of a series of communications between various groups within and outside an organisation.

Figure 2.7: EMS elements.



Adopted from Kirkland and Thompson, 1999. pp. 130.

Kirkland and Thompson (1999:130) expands further and state that a choice of a roll-out strategy depends on the environmental driving forces. Environmental driving forces are factors that create or change an organisation's environmental needs. These include legislative and regulatory framework, corporate culture, stakeholders and technology (such as financial systems). According to Gago and Antolio (2004:65) stakeholders affect, and are affected by, the decisions taken by organisations. The authors state that it is essential for managers to know both who they are and what are their attributes since they have different and often conflicting interests.

Henriques and Sadorsky (1999:89-90) and Weaver, Trevino and Cochran (1999:44), there are four groups of stakeholders, namely:

1. **Regulatory stakeholders:** They include the government, trade associations, informal networks and competitors. The government is responsible for making environmental regulation, while the other stakeholders in this group influence the regulatory framework and may convince the government to standardise an environmental practice or technology;
2. **Organisational stakeholders:** These are entities that are directly related to an organisation, namely: students, staff and management and these are the agents that have the greatest influence in determining the success or failure of any

environmental initiative.

3. Community stakeholders: They are community groups, environmental organisations, and other potential lobbies have the potential to mobilise public opinion in favour of or against an organisation's environmental performance; and
4. Media: By employing mass communication technology, the media can influence how the society perceives an organisation. According to Cordano (1993) and Dillon and Fischer (1992), cited by Bansal and Roth (2000:718), managers are able to avert negative public attention and build stakeholder support by being responsive.

The attributes are as follows (Gago and Antolio, 2004:68):

1. Environmental power: Capacity and ability to make the company adopt decisions in accordance with the stakeholder's environmental demands, either by means of economic rewards or punishments, by resorting to direct force or legal action, or by influencing the organisation's public image.
2. Environmental legitimacy: Capacity of the stakeholder's environmental demands to be considered as appropriate by managers.
3. Environmental urgency: the importance stakeholders give their environmental demands and how fast they demand satisfaction.
4. Environmental salience: Attention, time and priority managers accord to the stakeholder's environmental demands.



According to Rugman and Verbeke (1998), the hypothesis that environmental regulation represents a main determinant of managerial action to deal with environmental concerns has been tested empirically by Henriques and Sadosky (1996). The study reveals that stakeholders, may play a significant role in the development of an environmental plan at the organisational level. However, government regulation does represent the single most important source of pressure on organisations to consider environmental issues.

Gago and Antolio (2004:65) confirm the hypothesis that an increase in environmental power will also increase a stakeholder's salience. Also, their study confirms that environmental legitimacy and environmental urgency of a stakeholder influences its salience in a positive way, but denies that the capacity of a stakeholder to influence corporate environmental actions is as important for managers as the urgency and

legitimacy of its claim.

Also, Kirkland and Thompson (1999:131) inform us that the identification of the environmental driving forces affecting an organisation allows for their use in obtaining the commitment to develop an EMS and in determining what elements should be included in the EMS.

In their study, Kirkland and Thompson (1999:130) reveal that it is also important to recognise that environmental management involves a number of different stages or phases, depending upon which strategies are used for introduction, design and implementation. These stages are dynamic and are as follows:

1. developing awareness;
2. obtaining and maintaining commitment;
3. designing the EMS;
4. implementing the EMS; and
5. continual improvement.

Each may be hindered, or stopped, by various barriers as stipulated in Table 2.1. The specific barriers that may affect an organisation depend on the size of the organisation, the company's corporate culture, formal and informal management styles, individuals involved in the process and the stage of the organisation's EMS development. Many of these barriers may be related to one another. Often the presence of one barrier may increase the likelihood of, or lead to, another barrier.

According to Kirkland and Thompson (1999:131), an organisation may be at one of the following stages in regard to EMSs:

1. unaware of EMSs, or
2. aware and ignoring EMSs, postponing dealing with EMSs, starting EMS development, or using an EMS on a continual improvement basis.

According to their study, a major setback in EMS introduction is unfamiliarity with EMSs. Some organisations that are aware of EMSs do not recognise a need for introducing one;

thus the study further indicates that a significant number of organisations only deal with environmental matters after they have become a serious threat.

Table 2.1: Barriers to EMS introduction and/or implementation.

BARRIERS	
● Lack of recognition of the need for an EMS	➤ Lack of awareness of EMSs ➤ Lack of concern about environmental issues ➤ Reactive rather than proactive about environmental issues ➤ Belief that current practices are adequate
● Perceived cost of the EMS and underestimation of benefits ● Avoidance of the unknown	➤ Distrust or unfamiliarity with formal management systems ➤ Reluctance to use relatively-new solutions ➤ The interactive nature of the process
● Denial ● Resistance to complexity ● Concerns about legal issues ● No delegated responsibility or delegated responsibility with no resources or power to implement change ● Lack of studies, examples and explanations of how to implement an EMS ● Lack of skills, knowledge and expertise ● Reluctance to use external assistance (consultants) ● Problems with the resources(money, time skills, knowledge) ● Multiple stake holders with conflicting interests ● Application of inappropriate solution ● Lack of identification of specific drivers affecting the organisation ● Incompatibility with corporate culture ● Isolation of environmental issues and the EMS from other aspects of the organisation ● Multiple stakeholders with conflicting interests ● Loss of commitment	

Adopted from Kirkland and Thompson (1999:133).

Also, environmental issues are often given a low priority by organisations because environmental initiatives usually involve short-term costs and long-term benefits and business performance is usually measured in the short term.

Below is a discussion on the various barriers that may deter efforts to successfully introduce an EMS in an organisation.

- *Perceived cost of the EMS and underestimation of benefits*

Kirkland and Thompson (1999:132) point to the fact that organisational decision-makers have a shortcoming of being prejudicial and quick to associate EMSs with cost (sometimes high initial cost), and they are slow to recognise the benefits of an EMS.

The authors further attribute the problems with EMS costs to three factors, namely:

1. EMS costs are higher where experience with EMSs is limited and when organisations and the consultants that an institution use struggle to up a learning curve;
2. Financing and amortising the costs of a new EMS are not done over an appropriate time period. Since large capital investments are impossible without proper financing and amortisation, it is imperative that significant costs for an EMS are properly financed and amortised;
3. The benefits that can be derived are generally underestimated. Benefits from an effective EMS are of three different types, namely: direct savings, such as reductions in costs of solid and hazardous waste disposal, reduced energy costs and savings in product losses (spills etc.); indirect savings, through improved community and stakeholder relations (image) and easier approvals; and avoided costs, such as fines, civil damages, legal costs, clean-up costs and insurance premiums.

Unless these benefits are recognised and reasonably estimated, the costs of an EMS will appear to outweigh the benefits (Kirkland and Thompson, 1999:134).

- *Avoidance of the unknown*

The study by Kirkland and Thompson (1999:134) refer, citing from other studies, to absorptive capacity and define it as the ability of an organisation to recognise the value of new, external information, assimilate it, and apply it to commercial ends. The study reveals that, in the case of EMSs, the absorptive capacity theory suggests that EMS introduction will be most difficult in organisations that have little prior knowledge about EMSs, environmental management or management in general. The study concludes by stating this may be attributed to a very large fear factor or lack of expertise or understanding of EMSs.

Thus, according to Zutshi and Sohal (2004:406), employee resistance can be reduced or eliminated by developing awareness and understanding of the basics of the system, its significance and the detailed benefits derived from its implementation for the employees and for the organisation.

- *Denial*

Denial results from processes, such as the belief that if a problem is ignored for long enough it will resolve itself (Kirkland and Thompson, 1999:134).

- *Resistance to complexity*

Kirkland and Thompson (1999:135), in their study, state that one important role of EMSs is to make complex environmental issues manageable. Ironically, individuals and organisations may see an EMS as adding to the complexity they must deal with. Environmental concerns, whether raised by business partners, governments, the market, Environmental NGOs and the public, banks, investors or other stakeholders may be seen as an unfamiliar, unnecessary and unwelcome intrusion (Kirkland and Thompson, 1999:135).

Karapetrovic and Willborn (1998:204) confirm the assertion and motivate that, to a large extent, the common skepticism that exists among managers when it comes to introducing new standards for management systems is caused by misinterpretation

of the “management system”. The study by Karapetrovic and Willborn (1998) further elucidates the concept of management systems.

Sharp (2002:131) suggests removing risk and generation of organisational support by running pilot projects.

- *Concerns about legal issues*

Numerous studies, cited by Kirkland and Thompson (1999:134) record concerns that developing an EMS could result in the identification of issues with legal implications, such as non-conformance and confidentiality of information. Though efforts not to litigate offending corporations that disclose non-conformances during EMS implementation have been undertaken, concerns about identifying legal issues continue to deter pursuit of EMSs in many other jurisdictions abroad. However, provisions such as these do not yet exist in the South African legal framework (Kirkland and Thompson, 1999:135).

- *Lack of studies, examples and explanations of EMS implementation*

Literature contains little specific information on how EMS should be introduced, especially in South African universities. The barrier presented by the lack of studies will be greatest where the individual(s) designing and implementing an EMS have little or no practical experience in the process or where they are working in isolation from other practitioners (Kirkland and Thompson, 1999:135).

Sharp (2002:131) recommends allowing two to three years to establish a foundation of trust, organisational familiarity and skill base to be effective in medium to long term projects.

- *Lack of skills, knowledge and expertise*

Lack of skills, knowledge and expertise by those guiding the efforts may also hinder EMS implementation, while a number of organisations are attempting to develop EMSs. However, organisations that are not well established generally do not have

or allocate the resources to hire environmental specialists, at least until some significant outside stakeholder (major partner, bank, buyer) or driving force demands it (Kirkland and Thompson, 1999:135).

Sharp (2002:131) recommends involving risk tolerant staff that are willing to support low risk innovation and mentoring staff working toward the organisational vision for change. Moreover, tapping into talented, committed students and involving them and mentoring them through paid positions and/or research projects, ensuring that their work is relevant and integrated into university systems is recommended.

- *Reluctance to use external assistance (Consultants)*

Possible barriers may result from the client due to a consultant relationship - when an organisation requires the assistance of an outside consultant in introducing an EMS. Moreover, some organisations vying to introduce an EMS may have (Kirkland and Thompson, 1999:135):

1. reluctance to admit that a consultant is required;
2. doubts about the consultant's competence and integrity;
3. fear of becoming dependent on a consultant; and
4. fear of excessive consulting fees.

- *Incompatibility with corporate culture*

In designing an EMS, a right management framework should be imparted by the coordinator of environment programs. The coordinator must have freedom to engage all levels of the university community, access to generate and strategically draw upon the highest levels of management (Sharp, 2002:131).

EMSs should be designed according to 'the way the organisation does things' as they are most effective when they are within the boundaries of the current corporate culture (Kirkland and Thompson, 1999:135). Corporate culture is defined by Kirkland and Thompson (1999:135) as shared values, management style or prevailing attitudes within an organisation. According to them, it is

strongly influenced by the selection processes of hiring and advancement, education and training (or lack thereof), the reception or rejection of ideas and strong or dominant personalities. The authors further emphasised noting that there is a strong positive relationship between innovation success and its compatibility with the corporate climate. Compatibility of the EMS with corporate culture may be important in order to reduce dissonance for both organisational decision-makers and the organisation itself. An EMS that radically changes the way things are done within the organisation may be perceived by decision makers and other employees as a criticism of their work and meet with poor participant 'buy-in' (Kirkland and Thompson, 1999:135).

More importantly, the coordinator should be careful, according to Nel (2006:103), not to install agendas to reinstate what the colonizers did, namely to freeze African communities and cultures in essentialist and stereotyped modes. Furthermore, Nel (2006:103) states that "an attempt to freeze the the local community as fixed entities with inescapable essentialist characteristics shall be contra-productive". Moreover, the rich history of Africa reveals communities evolving and in flux, with an inherent strength to change and to face new circumstances.

Fitting in with the campus culture also requires community development. Nel (2006:100) informs us that the lack of community development is also a threat to their very nature. That the stagnation of local community development is a serious impediment to their very existence and identity. Furthermore, the marginalization and poverty of local communities endanger their essence, and in fact hamper their ethnic and cultural identity. The economic marginalisation and poverty of local communities do not only affect the materiality of survival, but put under pressure the knowledge and spiritual fibres of a community (Nel,2006:100).

● *Problems with resources*

The ISO 14001:1996 standard requires the most senior person in the organisation to sign the Environmental Policy, thus compelling him/her to commit to the process of EMS implementation. EMS introduction may be hampered by not recognising or providing needed resources. These resources may include personnel to design,

implement and guide the EMS, money and time. Resources may be a problem if they are not being allocated properly, or their simply not being available. Provision of inadequate resources may result from other barriers such as lack of commitment or prioritisation of other company issues over environmental management (ISO 14001:1996, Kirkland and Thompson, 1999:136 and Zutshi and Sohal, 2004:401).

- *No delegated responsibility or delegated responsibility with no resources or power to implement change*

Zutshi and Sohal (2004:404) state that the appointment of a champion, an Environmental Officer, has been identified as a key role for top management and an essential requirement for the smooth introduction, implementation and maintenance of an EMS. The ISO 14001 standard requires that at least a dedicated Environmental Officer be appointed as commitment to an EMS may be difficult to obtain when no one within an organisation takes, or is given, responsibility for dealing with environmental matters. Problems may also occur when the person(s) responsible for environmental matters within an organisation lack(s) the resources or power to implement environmental initiatives (ISO 14001:1996 and Kirkland and Thompson, 1999:136). It is thus the responsibility of top management to ensure availability of resources and that everyone in the organisation is made aware of the appointment/existence of this person (Zutshi and Sohal, 2004:404).

Sharp (2002:131) stated that effective coordination is essential in surviving and expanding a pioneering environmental initiative. Dedicated, respectfully persistent, skilled communicator, creative and personable qualities should be sought after.

Ideally, in the opinion of Zutshi and Sohal (2004:405), the champion should be representative from middle to top management level and should have communication (written and oral), negotiation and managing (people and procedures) skills. The person should be able to take on a range of responsibilities, have the authority to take appropriate actions, as required. Furthermore, the champion should be computer literate and have knowledge of company operations and procedures and be able to modify the existing systems and procedures as required in order to maintain and sustain the EMS.

- *Multiple stakeholders with conflicting interests*

An organisation should run with ideas along the path of less resistance whereby ideas that attract the most support are tried out and utilised as a means of generating the foundation for gradually more challenging ideas (Sharp, 2002:131). Organisations such as universities are more likely to have significant numbers of internal stakeholders, and may thus be challenged by internal stakeholders with conflicting interests. All organisations may, as well, have important external stakeholders who present conflicting interests and demands. Local landowners, community groups, environmental groups, regulators (municipal, provincial and federal), suppliers, buyers, contractors and partners may not all see environmental issues in the same way (Kirkland and Thompson, 1999:136).

- *Application of inappropriate models or programmes*

Sharp (2002:131) stated that before formalising systems it is crucial to ensure that there is informal support and general understanding. Application of inappropriate models or programmes may involve the attempt to apply a 'quick fix' where a more involved solution is required, or the attempt to apply general solutions to specific cases. Some organisations may be tempted into applying an easy but inappropriate type of 'EMS' instead of one that would meet the organisation's needs but would require greater effort, in terms of time, money or thought. Ashby's law of requisite variety (Ashby, 1983 cited by Kirkland and Thompson, 1999:136) states that "solutions to problems must match the complexity of the problem".

Care should be exercised as inappropriate solutions may be applied when an organisation uses a templated EMS without making suitable modifications to it. Many templated EMSs are now available. However, the authors' experience has been that templated EMSs invariably fail to meet the specific needs of organisations. The application of an inappropriate EMS can result in two negative effects. First, the organisation to which an inappropriate EMS is introduced usually becomes disenchanted with environmental management of any kind. Secondly, when stories of these 'mistakes' circulate within an industry, resistance to EMSs within the industry increases (Kirkland and Thompson, 1999:136).

- *Lack of identification of specific environmental drivers affecting an organisation*

Not identifying the specific environmental drivers affecting an organisation – that is, the forces that management – can result in underestimating the need for, and potential benefits of, an EMS and the development of an ineffective EMS. Resources may be wasted on issues which are of relatively little importance rather than being allocated where environmental performance can be enhanced. If problems are misunderstood (or not even identified), the solutions that are developed for them are likely to be ineffective (Kirkland and Thompson, 1999:136).

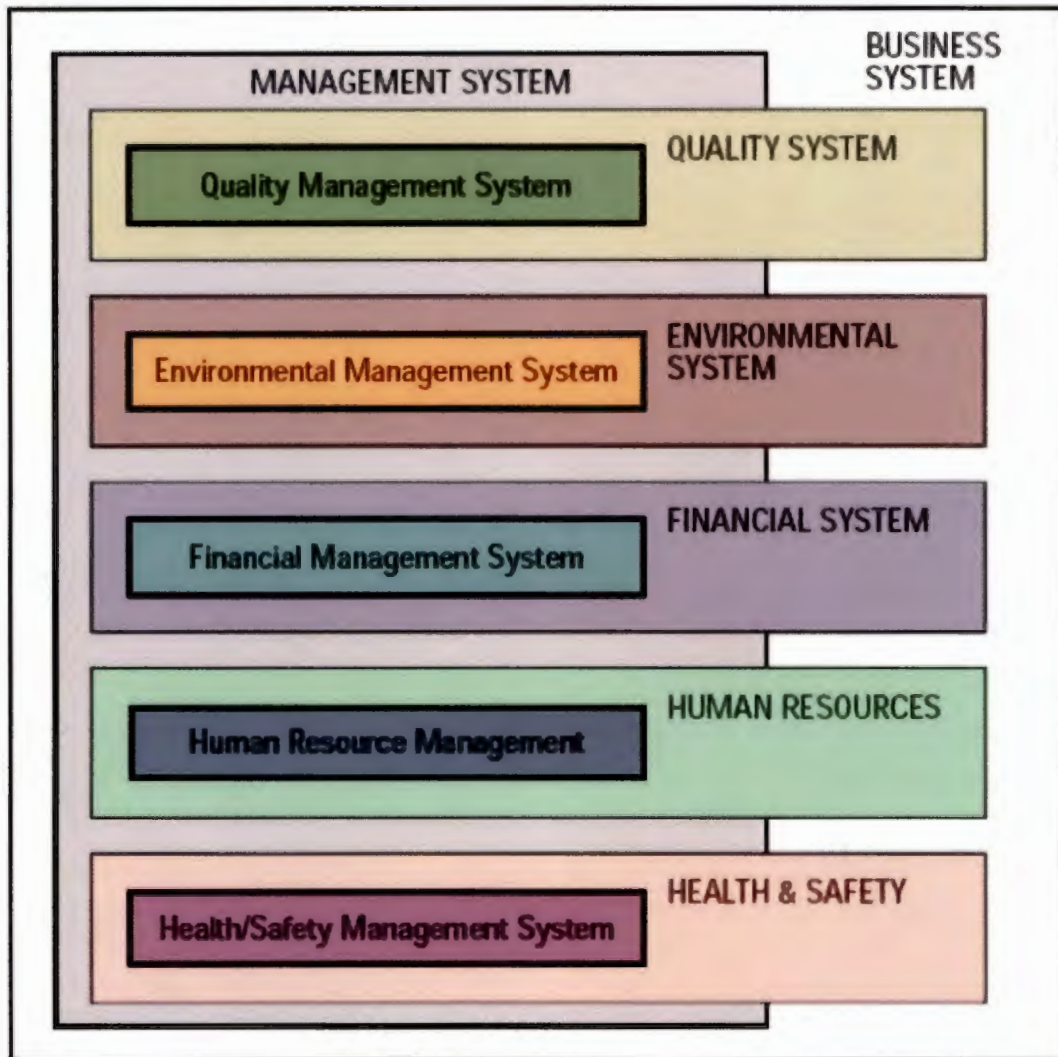
Maximising face to face communication is crucial as, according to Sharp (2002:131), dialogue is the most effective means of progressing with the change process. Learning the language of other people and developing active listening skills is essential.

- *Isolation of environmental issues and the EMS from other aspects of the organisation*

EMS failure may result if the EMS is not integrated with other systems within the institution. Environmental issues are related to other organisation issues, such as finances, profitability and overall management as shown in Figure 2.8.

If an EMS does not interact with appropriate segments of the organisation, it will, at the very least, be less effective than it could be otherwise. At the worst, an isolated EMS may not function at all. An essential feature of the EMS is the implementation of policies and practices in all corporate activities.

Figure 2.8: EMS and other related systems.



Adopted from Karapetrovic and Willborn, 1998. pp. 207.



This cannot happen if the EMS is isolated (Kirkland and Thompson, 1999:136). The study by Karapetrovic and Willborn (1998) informs on how to integrate the various systems within the organisation.

According to Azzonne and Noci (1998:100), when an institution develops programmes aimed at modifying the integration of different functional activities it sets itself on a path that will allow it to achieve radical improvements of its environmental performance and, hence, to exploit the economical and competitive opportunities resulting from the growing importance of the environmental challenge.

● *Loss of commitment*

According to Sharp (2002:131), management support and commitment should be secured in principle and should ultimately be substantiated with action when undertaking an environmental initiative. While current EMS models, such as ISO 14000, recognise that EMS introduction involves commitment, they do not address problems related to obtaining and maintaining commitment. Without commitment, EMS development may not be initiated, the EMS may be abandoned, or it may become an ineffective 'paper exercise' (Kirkland and Thompson, 1999:136). Top management commitment is possible if top managers understand the significance of adopting an EMS for their organisation. Educating themselves about environmental issues is the first step (Zutshi and Sohal, 2004:401).

Loss of commitment to an EMS during its design and implementation is, in the experience Kirkland and Thompson (1999:136) a common occurrence. Individuals who provide the initial commitment to an EMS may lose interest in, and commitment to, introducing an EMS when they become fully aware of what is involved in the process. While continual improvement is required to allow the EMS to improve and adapt to change, iteration may be misunderstood and taken as a sign of system failure rather than strength (Kirkland and Thompson, 1999:136). Sharp (2002:13) proposes that forums for broad community involvement, discussion and consideration should be set up. In these forums, learning experience should be shared with everyone who has any interest and a profile within and beyond the university for the efforts undertaken should be maintained.

The study by Lesabe and Nkosi (2007:37) argue that an understanding of organisational commitment as a concept is fundamental in the organisation. The study reveals that this approach will help management to understand what the real issues in the organisation are, which areas need attention, and what can be done to address the identified gaps. According to this study, definitions on commitment given in Table 2.2 point to :

1. being a stabilising and obliging force; and
2. providing direction to behaviour (for example: restricting freedom).

Table 2.2: Definitions of commitment.

COMMITMENT

"..... a state of being an individual becomes bound by his actions and through these actions to belief that sustains the activities of his own involvement."
(Salancik, 1977: 62)

"...a force that stabilises individual behavior under circumstances where the individual would otherwise be tempted to change that behavior."
(Brickman 1987: 2)

".... A stabilising force that maintain behavioral direction expectancy/ equity conditions are not met and do not function."
(Scholl, 1981: 593)

"Commitment come to being when a person, by making a side bet lead extraneous interests with a consistence line of activities."
(Becker, 1960: 32)

"... an obligation force which requires that the person to honour the commitment, even in the face of fluctuating attitudes and whims."
(Brown, 1996: 241)

Adapted from Lesabe and Nkosi, 2007, pp. 36.

Brouwer and van Koppen (2008:451) highlight another important aspect in implementing EMSs – the ability to measure environmental performance. The catch phrase within the environmental management discipline, that is: "If you don't measure it, you can't manage it", highlights the importance of the ability of organisations to measure their environment performance. Table 2.3 provides examples of common environmental indicators in international performance indicator framework.

The study further states that "environmental indicator systems, specific to an organisation, are an important tool in planning, steering and controlling environmental performance". Comparing indicators from year to year, and benchmarking allows for an evaluation of the relative environmental progress of an organisation (Brouwer and van Koppen, 2008:451).

Furthermore, measuring environmental performance is elaborated in the ISO 14031 standard, which is a guidance standard in the ISO 14000 Series of Standards. This standard offers a description of environmental performance evaluation in terms of definitions and management structure (plan-do-check-act), and an indicator typology.

Table 2.3: Common environmental indicators in international performance indicator framework.

PERFORMANCE INDICATORS	
● Output/process indicators	➤ Energy use (specified to kind of energy, e.g. fossil fuels, renewable energy, recycled energy) ➤ Material use (specified to kind of material) ➤ Specific emissions to the air (such CO₂, SO_x, (H) CFCs, VOC) ➤ Amount of emitted waste water ➤ Amount of composition of waste (domestic, industrial, dangerous) ➤ Recollection (withdraw) of waste
● Management indicators	➤ Total environmental costs ➤ Total environmental investments (in eco-technologies) ➤ Amount of and/or investment in environmental education ➤ Number of incidents and accidents ➤ Number of complaints ➤ Number of environmental ideas of personnel

Adopted from Brouwer and van Koppen, 2008.pp. 452.

The typology distinguishes between environmental condition indicators (ECIs), process or operational performance indicators (OPIs), and management performance indicators (MPIs) (Brouwer and van Koppen, 2008:451).

Eder (2001:327) states that chemical substances have a significant effect in controlling environment-related health risks. Chemicals can not only harm us directly in the home or the workplace, but also indirectly after being transported and transformed in the natural environment. In drafting policy, specialist knowledge is required of the environmental properties of chemicals, as well as the mechanisms and strategies for dealing with related problems (Eder, 2001:327).

MacDonald (2005:635) proposes an enhanced strategic planning framework for use in ISO 14001 when planning for sustainable development. The framework is based on the backcasting method, based on the work of Robert, Holmberg and *The Natural Step*, which includes the following A-B-C-D steps:

A) Awareness: developing a common understanding and awareness of the System Conditions for a sustainable society.

B) Baseline: developing a baseline of critical flows and management routines to understand where the organization is contributing to violations of the System Conditions.

C) Clear vision: developing visions with reference to the System Conditions, and solutions to the list of critical flows and management routines from “B”. “What will the organization look like in a sustainable society?”. Solutions and measures that are theoretically feasible are listed.

D) Down to action: prioritizing measures from the “C” list and managing the journey toward the clear vision. At this point, priority is given to such measures that combine the following characteristics:

- they should serve as platforms for further improvements in line with the System Conditions (avoiding blind alleys), and
- give an adequate return on investment.

2.7 Summary

Sustainability is characterized by economic growth based on social justness and efficiency in the use of natural resources. There is a common understanding in the literature, Azzonne and Noci (1998), Martin (1998), Rugman and Verbeke (1998a), Kirkland and Thompson (1999), Henriques and Sadosky (1999), Bansal and Roth (2000), Herremans and Allwright (2000), Pretty and Ward (2001), Khan (2002), Sharp (2002), Gardiner *et al.* (2003), Ryan (2003), Gago and Antolio (2004), Zutshi and Sohal (2004), MacDonald (2005), Field (2006), Savely *et al.* (2007), Alshuwaikhat and Abubakar (2008), Brouwer and van Koppen (2008) and Perotto *et al.* (2008), that a sustainable university campus implies a better balance between economic, social and environmental goals in policy formulation as well as a long-term perspective about the consequences of today's campus activities.

Various theories were thus presented and adopted in this study in an attempt to lay a foundation which shall promote the endeavour of establishing the Mafikeng campus of the North West University as a sustainable campus with a sustainable campus community.

The next chapter shall present the research problem and research questions.

3.1 Introduction

The previous chapter dealt with the theoretical foundation and literature review as a basis for chapter 3 in which the research problem and research questions are formulated.

3.2 Problem statement

South Africa is grappling with balancing the demands placed on natural resources by economic development with the reality of severe natural resource limitations. The recent power failures experienced nationwide resulting from the country's power utility's (Eskom) failure to guarantee a continuous supply of electricity attests to this fact. The government of the country now faces a challenge of finding ways of addressing the challenges to make progress towards sustainable development.

Given South Africa's wealth of both biological, cultural diversity and the unfortunate repercussions of apartheid, the country is made up of diverse cultural backgrounds with people viewing the environment differently. The South African society is thus grappling with deeply divided views on the environment. The wealthy whites and anti-development groups are the major active agents that promote environmental conservation, while there is a poor contribution from blacks. In many cases, the poor contribution is, in most circumstances, profoundly shaped by the historical lack of access to environmental services and their benefits.

In the study by Nel (2006:100), the author indicated that the lack of community development was also a threat to their very nature. Furthermore, the stagnation of local community development was seen a serious impediment to their very existence and identity. According to the author, what exasperated the situation was the marginalisation and poverty of local communities whose essence is endanger due to such marginalisation and poverty. In fact it thus hampered their ethnic and cultural identity. The economic marginalisation and poverty of local communities do not only affect the materiality of their survival, but put under pressure the knowledge and spiritual fibres of a community.

The state of the environment in towns and cities compared to the townships is appalling. Most South African townships are still grappling with issues of service delivery whereby the black communities still do not have access to the basic services and are infested with problems such as illegal waste dumping and lack of proper sewerage system.

This phenomenon is also mirrored in the higher education cycles whereby historically white universities are effectively carrying out programs to promote integration of environmental stewardship in daily activities within campus life, while on the contrary historically black universities are still lagging behind. The *status quo* notwithstanding, these institutions are expected to produce leaders in the corporate world who shall advance the aspirations of economic excellence at par with sustainable development. This is a highly unlikely possibility; though there may be exceptional cases.

The ongoing merger processes of institutions in the South African higher education landscape are expected to bridge this divide (amongst others); however this is tantamount to expecting whites to solve "black problems". In South Africa's new democratic dispensation, this attitude can no longer be condoned. Unless blacks learn to stop taking solace from blaming others for their demise and expecting whites to come and save them; the country may as well expect to spend another decade of democracy in lamentation. Thus, the black intellectuals should be at the forefront of eradicating this dependence mentality and start on taking initiative and claim responsibility for the livelihood of their nation.

The Mafikeng campus of the North-West University, currently in a development stage resultant from the merger of the former University of the North-West (UNW), the Potchefstroom University for Christian Higher Education (PU for CHE) and the former Sebokeng Campus of the Vista University (VISTA), needs to re-examine fundamentally its primary activities and manage its operations in new and novel ways that challenge conventional thinking on business, education and the environment by introducing and implementing an EMS (Strachan, 1997).

Based on the work of the authors, particularly that by Cooper (2006), reviewed in the previous chapter this study sought to investigate the need for implementation of an EMS at the Mafikeng campus of the North-West University, the nature thereof and possible

barriers that could deter the efforts to successfully implement the EMS. The research results should provide a basis to inform and facilitate implementation of an EMS in the Mafikeng campus of the North-West University.

The following research questions arise henceforth:

1. Is introducing a formal EMS necessary to promote sustainable development in the Mafikeng campus of the North-West University?
2. Which EMS standard should be the basis of implementation?
3. What are the possible barriers that can deter efforts in introducing an EMS?

3.3 Summary

In chapter 3 the problem was stated and three research questions formulated. Chapter 3 presented the increasing challenges of addressing environment issues in South Africa aggravated by the socio-economic disparities across the cultural landscape. The community of the Mafikeng campus of the North-West University, in pursuit of establishing itself as a distinguished academic institution, was seen as having a significant role to play in promoting sustainability through integrating the environmental agenda in the dynamics of the ongoing merger process PU for CHE and VISTA. The research design followed in the study is outlined in chapter 4.

4.1 Introduction

In the previous chapter the research problem and questions were articulated. An exposition of the research design followed in the study and how the data were analysed are presented in chapter 4. The following aspects are dealt with: concepts related to research methodology, research approach, sampling, measuring instrument and data analysis.

4.2 Concepts related to research methodology

Before expanding on the research design and analysis in this study, it is essential to first give a brief discussion of concepts related to research methodology. This is done to allow easier understanding of why a certain research paradigm, and related designs and instruments, were chosen over others.

A research design is a set of guidelines and instructions, to be followed in addressing the research problem, on how to reach the goal that the researcher has set for himself/herself (Webb and Auriacombe, 2006:589).

The nature of the available data and data required are major factors to consider during research design. Data may be (Mouton, Auriacombe and Lutabingwa, 2006:580):

1. secondary data: data on the research project/study already collected by others; or
2. primary data: original data gathered through a research study.

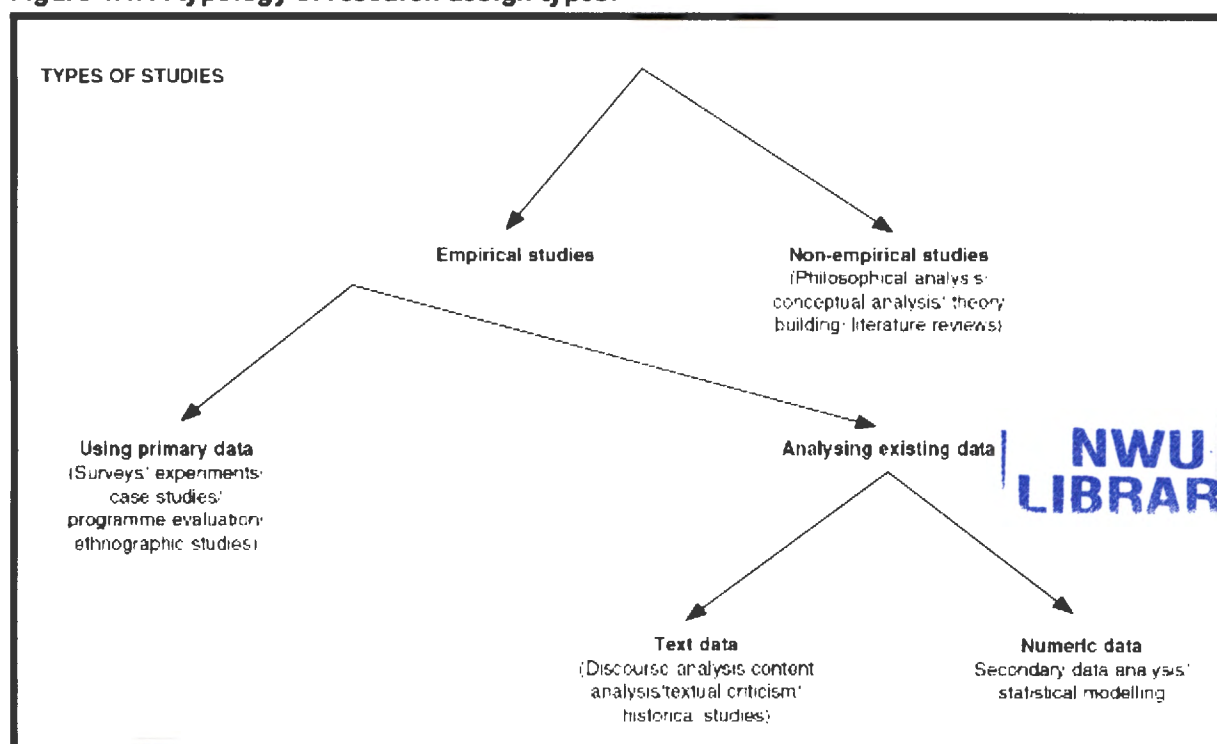
Two data types can be distinguished under primary data (Mouton *et al.*, 2006:580):

1. Qualitative (or textual) data aims not to generalise about the specified population, but to uncover new ideas from, or hidden feelings/beliefs of respondents. Qualitative data collection is usually done with small numbers of respondents using unstructured (not unplanned) interviews. This includes methods such as focus groups, one-on-one in-depth interviews and observational methods.

2. Quantitative (or numerical) data aims to generalise about a specific population, based on the results of a representative sample of that population. Quantitative research generally involves the collection of primary data from large numbers of individuals and projecting the results to a wider population. Some methods are mail surveys, telephone interviews, personal interviews, panels and diaries.

These data types have culminated mainly into two research paradigms, namely: quantitative research designs and qualitative research designs. However, it is not uncommon for researchers to use a combination of the two designs (Webb and Auriacombe, 2006:591). Refer to figure 4.1.

Figure 4.1: A typology of research design types.



Adopted from Mouton *et al.*, 2006.

pp.581.

Regarding the research methods used, Webb and Auriacombe (2006:591) stated that quantitative research uses methods adopted from the natural sciences that are designed to ensure objectivity, generalisability, and reliability. In quantitative research, the researcher is considered to be external to the subjects (an *outsider*), and results are expected to be replicable no matter who conducts the research. Qualitative techniques, on the other hand (Cooper and Schindler 2006:196), include an “array of interpretive techniques which seek

to describe, decode, translate, and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world."

Moreover, the qualitative research paradigm provides the researcher with the perspective of target audience members through immersion in a culture or situation and direct interaction with the people under study (an *insider* view). Qualitative research methods used in social research include observations, in-depth interviews, focus groups and the analysis of personal documents. These methods are designed to help researchers understand the meanings people assign to social phenomena and to elucidate the mental processes underlying behaviours. Hypotheses are generated during data collection and analysis. In the qualitative paradigm, the researcher becomes the instrument of data collection, and results may vary greatly depending upon who conducts the research (Webb and Auriacombe, 2006:591).

In making generalisations to people and events that have not been observed familiarity with the concept known as sampling becomes paramount. Burger and Silima (2006:656) define sampling as a process of selecting observations. This process manifests itself from the inability of a social researcher to observe all actions relevant to a social phenomenon. In their study, Burger and Silima (2006:656-657) align themselves with the definition of a sample as being a specific subset of a population observed in order to make inferences about the nature of the total population itself. Furthermore, their study attributes the importance of sampling to its ability to facilitate feasibility. It is often too costly and impractical to study an entire population and researchers make use of sampling to save time and resources. Burger and Silima (2006:656-657) define sampling design as that part of the research plan that indicates how cases are to be selected for observation. The authors categorised sampling into two broad classes: probability and non-probability sampling.

Probability sampling designs are commonly associated with quantitative research, where the emphasis is on the quantification of constructs. Several probability sampling designs that are available to the researcher, namely: simple random sampling; systematic sampling; stratified sampling; cluster sampling; multistage cluster sampling and probability proportionate to size (PPS) sampling are discussed in more detail in the study by Burger and Silima (2006:659-662) .

Non-probability sampling designs are commonly associated with qualitative research. Some of the frequently used non-probability sampling designs are, according to Burger and Silima (2006:659-662): accidental sampling; purposive/judgemental sampling; quota sampling; referral sampling (classified into network sampling and snowball sampling). A detailed discussion of these sampling designs is also found in the study by Burger and Silima (2006:662-665).

Another important activity in the research process is explaining the elements that constitute measurement. A definition of measurement is given in the study by Auriacombe (2006:631). The study refers to measurement as limiting the data of any phenomenon – substantial or insubstantial – so that those data may be examined mathematically, and ultimately, according to an acceptable qualitative or quantitative standard; thus the process of measurement therefore involves moving from the abstract concepts to the concrete. The measurement issues that are addressed in a research process are (Auriacombe 2006:631):

1. *Conceptualisation*: the process of specifying the vague and mental imagery of concepts, sorting out the kinds of observations and measurements that will be appropriate for the research.
2. *Specification of variables and indicators*: an indication of the presence or absence of the concept studied. The study defines a variable as a descriptive or analytical attribute that can take on different or varying values under different conditions. Furthermore, an indicator is a measure that gives a concrete, measurable but indirect value to an otherwise unmeasurable, intangible concept.
3. *Operationalisation or implementation of variables*: Putting a variable, found in a research question or hypothesis, in a form that permits some kind of measurement.

Webb and Auriacombe (2006:589) further stated that a research design consists of a plan, a roadmap, that allows the researcher to test the validity of his/her hypothesis or answers to his/her questions, taking into account the factors that he/she believes might affect the relationship between the dependent and independent variables.

4.3 Research approach

This study adopted a qualitative research paradigm. This research approach generates rich, detailed data that leave the participants' perspectives intact and provide a context for understanding behaviour. It is committed to viewing events, norms and values from the perspective of the people who are being studied. It allows the researcher to provide detailed descriptions of the social settings he/she investigates. The researcher can also make attempts to understand events and behaviour in the context in which they occur, following a holistic approach; and views life as streams of interconnecting events, an interlocking series of events and as a process of constant change (Webb and Auriacombe, 2006:597).

A mixture of ethnography and phenomenology were adopted as research methods of choice in trying to find answers to the research questions. According to Webb and Auriacombe (2006:598-600) ethnographical studies allow the researcher not only to observe behaviour, customs, objects and emotions of a foreign cultural grouping, but also seek to inquire about the meaning of these phenomena to its society. Phenomenological studies, on the other hand, focus on people's subjective experiences and interpretations of the world. Furthermore, in phenomenology, human experiences are examined through the detailed descriptions of the people being studied. The researcher wants to understand how the world appears to others and this involves studying a small number of subjects through extensive and prolonged engagement to develop patterns and relationships of meaning derived from a particular social reality or phenomenon (an inductive approach).

Participant observation was conducted in the Mafikeng campus of the North-West University where permission was granted. Refer to appendix 3. The researcher is currently enrolled at the Mafikeng campus of the North-West University and has been a student at the campus for six years. This enabled the researcher to closely observe the participants and in this way an in-depth study of the participants was done.

Table 4.1 indicates the research instruments applied in this study, number of discussions and respondents that participated in the study.

Deductive approaches, whereby the researcher utilised theoretical concepts and ideas

derived from abstract work of scholars available in the literature, were also applied in this study. The approaches taken were adopted so as to ensure that the reliability of data was not threatened.

Table 4.1: Research instruments, number of discussions and respondents.

Research instrument	Total number of discussions conducted	Total number of participants or respondents
Semi-structured interviews: Students	35	35
Semi-structured interviews: Staff members	5	5
Semi-structured interviews: WMSP	1	1
Key informant interviews: Management	3	3
Total	44	44

4.4 Sampling

A sampling design chosen for this study is purposive/judgemental non-probability sampling. According to Burger and Silima (2006:663), in this form of sampling, the researcher relies on his/her expert judgement to select units that are representative or typical of the population. The general strategy is to identify important sources of variations in the population and then to select a sample that reflects this variation (Elliot and Jankel-Elliott, 2003:216). This sampling design is appropriate for this study as ethnography makes use of small samples of informants: opportunistic samples – whoever seems likely to give “rich” data, judgemental samples – seeking out people who may have specialist knowledge in an area.

The senior management of the Mafikeng campus of the North-West University, with required authority as per the Statute of North West University published in the Government Gazette on 8 August 2005 (No. 27872), granted permission to the researcher to conduct the study at the institution. In the meeting between the researcher and senior management, the researcher identified four individuals in the management team (key informants) of the Mafikeng campus who had a direct bearing on this study.

The individuals in the management team, their names are not disclosed for confidentiality reasons, were approached and were asked to participate in the study. One informant

declined participating in the study and the rest accepted. Upon accepting to participate in the study, the researcher contacted the key respondents and arranged for conducting interviews. The key informants were thus asked to identify members of the target population who are socially linked to the respondent at the conclusion of the interview. Thus, additional three members of the target population were identified and are referred in this study as the waste management service providers (WMSPs).

The population of Waste Management Service Providers (WMSPs) contracted by the Mafikeng campus of the North-West University comprises of two contractors from the private sector and the municipality. A semi-structured interview with a single WMSP, an opportunistic and purposive sample representative of the WMSP population, was conducted. The WMSP was chosen on the basis that the company possesses relevant and expert knowledge about the developments and practices within the waste management industry.

Saturation and recurrent patterning, resulting from causal conversations, which were eventually summarised in the general field notes, with some staff members and students in the campus, led to a situation whereby additional participants provided similar, rather than dissimilar information, on environmental practices within the campus.

The researcher acknowledges the limitation with the purposive sampling method used as one cannot evaluate to what extent these samples are representative of the relevant population and this method easily lends itself to sampling bias.

4.5 Measuring instrument

Cooper and Schindler (2006:253) provide a comprehensive comparison of communication approaches used to obtain data. The advantages and disadvantages of self-administered surveys, telephone surveys and surveys through personal interviews are dealt with in depth by them. Using this as a basis, it was decided to use semi-structured one-to-one interviews and key informant interviews in conducting the present study.

Key informant interviews are interviews that are conducted with people who have a special

position in the community. Key informants possess special knowledge and are willing to share this with the researcher. They have access to the university systems under study in a way that the researcher lacks (Hudelson, 1994:43 cited by Maluleke and Troskie, 2003:53).

Guidelines from the College and University Environmental Management System Guide (2007) were used to guide the interviews. This approach was chosen as it helped the researcher to determine if the Mafikeng campus of North-West University has systems and procedures in place that would enable the campus to be in compliance; identify opportunities to reduce or avoid costs; and promote sustainability. The approach would enable the researcher to determine if there would be a need for making improvements, in case systems and procedures were in place; or that a new management systems would have to be implemented.

Although the questions in the interviews are not composed of and do not request any type of sensitive or confidential information, responses were set up to be received and handled confidentially.

The research instruments used were applied so as to be sensitive to the cultural distinctiveness of the university community researched and its diverse definitions, meanings, and subjective experiences of campus life and the social, economic, and political environments in which they live.

Digital recording of the interviews with the key informants were transcribed and the printed transcripts of semi-structured interviews with the respondents were administered back to them via sending email to their email addresses, obtained from their secretaries, to validate the data and consequently obtain their views about the data gathered.

Interviewee responses were compiled and grouped by question. Key phrases, concepts and themes were compiled in summary tables and assessed for strength and frequency.

To ensure the reliability of the data gathered, the research applied both inductive and deductive approaches. The inductive approach focuses on identifying patterns and

meaning derived from a particular social reality or phenomenon and deductive approaches utilise theoretical concepts and ideas derived from abstract work of scholars available in the literature.

4.5 Data analysis

Field notes play an important role as they are written records of social activity written up as soon as possible after the event. Data was analysed based on the attributes of field notes as reflected below (Elliot and Jankel-Elliott, 2003:216):

1. *Space*: the physical place or places.
2. *Actor*: the people involved.
3. *Activity*: a set of related acts people do.
4. *Object*: the physical things that are present.
5. *Act*: single actions that people do.
6. *Event*: a set of related activities that people carry out.
7. *Time*: the sequencing that takes place over time.
8. *Goal*: the things people are trying to accomplish.
9. *Feeling*: the emotions felt and expressed.

Elliot and Jankel-Elliott (2003:219) highlight that these field notes attributes are a valuable part of the data as they can also record changes in what the researcher sees as significant as their interpretations develop.

4.6 Summary

Chapter 4 served to outline the research methodology. This study was conducted in a qualitative paradigm and adopted a mixture of ethnography and phenomenology.

5.1 Introduction

Chapter 5 reflects the findings of the study based on the methodology presented in chapter 4.

5.2 Characteristics/demographic information of respondents (N = 44)

The researcher approached employees, top management, extended management, contractors, and students to share their stories and experiences. Informed by the belief that both inductive and deductive approaches are required, both tactics were applied in this research. That was also done to ensure that the reliability and validity of the study is not threatened. A total of 44 respondents participated in the study.



The respondents in the study constitutes of key informants from the Mafikeng campus of the North-West University's top management and extended management with the necessary postgraduate qualifications in environmental management and/or those that possess the necessary decision making authority in critical areas affecting the environment. Other respondents are from the population of Mafikeng campus staff members who are members of the Staff Association, lecturers that possess knowledge in environmental science and some professors with expertise in environmental management. A laboratory technician in the institution was also interviewed. A waste management service providers with expertise in waste management was also interviewed. Post-graduate students with a minimum of 3 years enrollment at the Mafikeng campus of the North West University and members of the campus student representative committee were also interviewed.

Table 5.1 Subjects of the research project

No	Name	Why were they consulted?
1	Management (N = 3)	Members of the university Senate; Decision Making Authority; Qualifications in Environmental Management.
2	WMSP (N = 1)	Member of the Waste Management Institute of South Africa; Experts in waste management; Managers of waste at the Mafikent campus of the North West University.
3	Staff (N = 5)	Members of university Staff Association; Lecturers at the Mafikent campus of the North West University.
4	Students (N = 35)	Minimum three years enrollment at the Mafikent campus of the North West University; Members of CSRC.

5.3 Research results

The findings in general revealed that there is unfamiliarity with environmental management systems, mostly amongst the student population, at the Mafikeng campus of the North-West University. More specifically the results for the three research questions are presented below.

5.3.1 The necessity of introducing a formal EMS to promote sustainable development in the Mafikeng campus of the North-West University

In determining whether the introduction of a formal EMS shall help the university promote sustainable development the following themes emerged, namely: **compliance** with the legal environment requirements; **water and energy** consumption; **waste** outputs; institution's **public image**; **sustainability** and **responsiveness** to environmental issues. Table 5.2 is a reflection of how the respondents perceived the current effort at compliance and sustainability at the institution.

Positive outcomes to the questions raised shall imply that the institution has a sustainable environmental management system in place, otherwise management and other stakeholders should endeavour to promote sustainability by striving to convert the negative outcomes to positive ones.

Table 5.2: Current efforts at compliance and sustainability at the Mafikeng campus of the North-West University.

Category	Responses	Frequencies														
		Total: N = 44			Management			Staff		WMSP			Students			
		Yes	Not sure	No	Yes	Not sure	No	Yes	Not sure	No	Yes	Not sure	No	Yes	Not sure	No
Compliance	Do you know what legal environmental requirements apply to your operations	3	0	0	5	0	0	1	0	0	10	13	12			
	Are your operations in compliance?	0	2	1	1	3	1	0	1	0	5	18	12			
	Are you always aware of the status of your institution's compliance?	0	2	1	0	0	5	0	0	1	0	0	35			
	Does the institution have an Environmental Officer appointed on a full-time basis?	0	0	3	0	0	5	0	0	1	0	30	5			
	Does the institution have a formal environmental management system ?	0	0	3	0	0	5	0	0	1	0	3	32			
	Do you believe introducing an ISO 14001 EMS would help the institution comply?	2	0	0	3	0	0	1	0	0	0	0	0			
Waste	Do you know how much solid and hazardous waste is generated and potential ways to reduce volume, toxicity and associated disposal costs?	0	1	2	0	0	5	0	0	1	0	0	0			
Water	Do you know your annual water use and costs as well as potential ways to reduce them?	0	1	2	0	0	5	0	0	0	0	0	0			
Energy	Do you know your annual energy use and costs as well as potential ways to reduce them?	0	1	2	0	0	5	0	0	0	0	0	0			
Public image	Do you think the general public thinks that your institution is committed to the environment and sustainability?	0	0	3	0	2	3	0	0	1	0	5	30			
Responsiveness	Do you often feel that you are reacting to crises rather than being proactive?	0	1	2	0	3	2	0	1	25	5	5	0			
Sustainability	Does your institution have sustainability projects or initiatives that you know?	0	0	3	0	0	5	0	0	1	0	5	3			

- *Compliance*

The management of the Mafikeng campus of the North-West University is aware of the legal environment requirements which are applicable to the campus. However, most managers are of the opinion that the operations are partly compliant and attribute this to the lack of a system that would ensure that they are always aware of the status of the institution's compliance.

The campus does not have an Environmental Policy in place to guide environmental initiatives and facilitate identification of aspects and setting of environmental objectives.

Moreover, the campus has no Environmental Officer appointed on a full-time basis designated to oversee safety, health and environmental issues within the institution further exasperating its compliance woes.

The institution lacks a formal EMS to help management to properly handle environmental issues.

Staff members are familiar with the legal environmental requirement that apply to their operations, but they are not pleased with the level of compliance. Students on the other are mostly not sure how the legal requirements applied to their operations and about the level of compliance in the campus.

- *Waste*

The management at the institution agrees that proper records of the waste outputs generated have not been kept. The institution has contracted two waste management service providers (WMSPs) to dispose of its solid and health care waste, but does not enforce them to report on the waste disposed. However, the municipality handles and disposes of most of the solid waste at the Mafikeng landfill site. Another WMSP delivers the health care waste for incineration from the institution to a nearby incinerator.

Various concerns were highlighted with regard to monitoring and tracking of waste from source to destination. A number of cases were cited by the participants. Firstly, the lack of

proper fencing and management at the Mafikeng landfill site raised serious concerns. The waste dumped there poses health and safety issues to the surrounding communities and threatens underground water pollution due to lack of proper control. Secondly, the chemical residues from experiments conducted by students are not classified in terms of material safety datasheet to enable safe disposal thereof. Thirdly, the WMSPs are not been monitored to ascertain that they dispose of the waste from the institution at licensed facilities.

Potential ways of reducing the volume of waste have not been contemplated by management as records were not kept before. However, according to one participant, some WMSP reclaims scrap paper and bottles for recycling purposes as a way to reduce volume of landfilled waste. Measures to reduce volumes, toxicity and associated disposal costs of other waste materials have not been established.

Despite the fact that this issue applied to the management of the Mafikeng campus, students and other staff members believed that such records were not kept by management.

- *Water and energy*

The institution has records of water and energy consumption. However, what the issue of interest was to determine if the costs associated with consumption were monitored and whether management has established means of reducing them. The findings revealed that there are no such means in place as one participant said: "Personally, I recommended that students be made aware of the impacts of their daily activities on the environment as I am sure that many are ignorant of them."

As this issue also applied to the management of the Mafikeng campus of the North-West University, students and other staff members believed that such records were not kept by management.

Some participants such as students and staff members acknowledged not paying attention to the consumption of water and energy in their daily lives within the campus.

- *Public image*

There was a general concern regarding the negative public image of the Mafikeng campus of the North-West University. Some participants believed that the state of the environment in the campus was better during the former Bophutatswana government. However, others felt that the merger process brought with it some positive changes.

The participants were unanimous in deciding that something needed to be done urgently to address the environmental issues within the institution. One participant said: "this study comes as a coincidence as it came during a period when the management was planning on undertaking a green campus initiative in 2008." Another participant also reinforced the need to undertake an environmental awareness initiative to promote environmental conservation and sustainable practices.

- *Responsiveness*

Twenty five out of forty four participants acknowledged having being mostly reactive to crises. The presence of weaknesses in the current environmental practices within the institution notwithstanding, one participant attested to being proactive in a number of cases. However, the participants were unanimous in deciding more work needed to be done to address this issue as the approach has been mostly reactive to crises.

- *Sustainability*

Most of the participants from the management and staff population of the Mafikeng campus of the North-West University are aware of the fact that the campus has no Environmental Policy in place. However, most students are not aware if such exists while others simply do not know.

One participant stated that some aspects of an Environmental Policy are found in the Institutional Quality Management System, but there is no Environmental Policy as such in the institution.

The Environmental Policy is supposed to be the bedrock of developing sustainable practices. The absence of an Environmental Policy implies that there are no clearly

defined environmental concerns (aspects) and set targets and objectives to address the environmental concerns.

Lack of an environmental forum or committee established by either staff and/or students at the Mafikeng campus was identified, by the participants, as among the factors that have resulted in the poor state of the environment awareness and lack of environmental initiatives within the Mafikeng campus .

Two participants pledged their support to an introduction and implementation of an EMS at the Mafikeng campus of the North-West University. They also committed to availing resources to seeing such an environmental initiative at the campus become a reality.

Furthermore, one participant remarked: "it will be a good thing to integrate environmental management with the institution's academic curricula."

5.3.2 The nature of the EMS to be implemented

In so much as there was a consensus amongst management regarding a need to introduce an EMS in the Mafikeng campus of the North-West University, knowledge of standard-based EMSs required someone with relevant information on such systems. The participants believed that adopting the ISO 14001 EMS standard would help the institution positively address its environmental issues, thus promoting sustainable development.

Two of the participants, despite being aware of the cost implications, committed to availing resources necessary to promote the initiative.

5.3.3 Possible barriers that can deter efforts in introducing an EMS

In determining the possible barriers that can deter efforts in introducing an EMS an analysis of responses by the respondents given in table 5.2 revealed the following findings:

- Environmental issues are isolated from other aspects in the institution. The lack of

integrating environmental issues with other systems, such as finance, health and safety and quality management amongst others, within the organisation may prohibit successful introduction of an EMS at the Mafikeng campus of the North-West University.

- Failure to appoint an environmental champion with vested power and resources to implement change at the campus aggravate the environmental problems experienced. The champion would keep records of documentation pertaining to water and energy consumption; devise means to reduce volume of waste disposed to the landfill and associated disposal costs.
- Incompatibility of the EMS with the culture of the Mafikeng campus, which is predominantly South African, is bound to put the EMS introduction and/or implementation to a halt. Whoever shall implement the EMS should be accustomed with this culture.
- Lack of skills, knowledge and expertise of environmental management systems adds to the environmental woes within the campus. As the campus awaits the green initiative, the institution should guard against application of inappropriate solutions.
- Some of the developments in the campus are not entirely compliant with the legal requirements and this matter required urgent attention. The findings raised serious concerns and may thus inhibit successful EMS introduction as some information may be withheld in fear of possible litigation against the institution or victimisation of participants in this study. However, the institution acknowledged the existence of pressing environmental issues that it needed to address and committed to resolving them.
- A major barrier identified for the introduction and/or implementation of the EMS is the lack of South African studies, examples and explanations of how to implement an introduce and/or implement as EMS in a university. By introducing and implementing an EMS, the Mafikeng campus of the North-West University would thus be at the cutting edge and is likely to experience its own share of hard knocks.

This may thus result in the loss of commitment in the introduction of the EMS.

- The merger process of the Mafikeng campus of the North-West University with other campuses was identified as possible deterrent to successful EMS implementation. The findings point to an existence of discomfort amongst the staff members as the institution is undergoing transformation which saw some of their colleagues losing their jobs. Some of the students are also opposed to the merger of the Mafikeng campus with other campuses for many other reasons. The findings revealed that, depending on how the merger process is handled, the EMS implementation may be met with some resistance. This is a problem of multiple stakeholders with conflicting interests.
- Another possible hinderance was attributed to a lack of awareness of EMSs amongst students and staff. Lack of concern on environmental issues was amongst the possible barriers that could deter efforts to EMS implementation and thus needed immediate attention.

5.4 Summary

The participants in the study comprising of the Mafikeng campus of the North-West University's management, staff, WMSP and students were interviewed and the findings of the study were presented. The participants were forty four in total.

The findings revealed that an introduction and/or implementation of Environmental Management System is required, not only by management, but the entire community in the campus. Though the participants mostly exhibited limited knowledge about standard-based EMSs, the ISO 14001 EMS was preferred.

A number of possible barriers that could prevent successful introduction and/or implementation of an EMS were identified.

A discussion of the research findings is presented in chapter 6 followed by conclusions, along with limitations of the study, and recommendations.

6.1 Introduction

In chapter 1 the reader was orientated and introduced to the research objectives. The theoretical foundation and literature review was presented in chapter 2. The problem was formulated in chapter 3. An exposition of the research design and analysis was given in chapter 4. The research results and interpretation thereof followed in chapter 5. Chapter 6 focuses on the discussion of the outcomes of the study, draws conclusions and makes recommendations.

6.2 Discussion

Below is a discussion of research findings pertaining to the implementation of an EMS at the Mafikeng campus of the North-West University .

6.2.1 The necessity of introducing a formal EMS to promote sustainable development in the Mafikeng campus of the North-West University

Upon analysis of the findings presented in table 5.2, the results presented an outcome that an EMS is necessary to promote sustainable development in the Mafikeng campus of the North-West University.

Promotion of sustainable development requires that environmental stewardship be integrated in the daily activities of everyone in the campus.

As suggested by Sharp (2002), systematic transformation in greening the campus Kirkland and Thompson(1999) requires that management should:

1. Integrate environmental concerns into the University's business planning.
2. Demonstrate a commitment to environmental protection that goes beyond environmental compliance.
3. Institute a formal environmental risk management program. This program should be

used to assess potential risks from all proposed and existing operations.

4. Employ capital budgeting evaluation criteria to allow environmental projects to compete fairly for investment resources.
5. Formulate institutional policies that establish an environmental sense of direction for facility level operations.
6. Establish environmental criteria for the selection and management of contractors/vendors.

However, based on the findings, none of the above activities are conducted by management at the campus. One participant was concerned about some developments at the institution approved and exempted from compiling environmental impact assessment reports. Furthermore, the participant was eager to investigate the matter. On the contrary, another participant, opposed this opinion. The differences in opinions signify that the Mafikeng campus lacks a system that will keep everyone up-to-date information regarding the level of compliance in the campus.

Moreover, the institution's lack of a formal EMS adds to the compliance woes of the campus. Even though it is not required by law for an organisation to introduce and/or implement an EMS, the management feels that measures such as introduction of an EMS must be put in place in order to help address the environmental challenges faced by the institution.

As Kirkland and Thompson (1999) and Sharp (2002) had suggested, in obtaining participant 'buy-in' the EMS should be built around the culture of the campus. Even if an EMS will assist the institution, it may be implemented poorly if it is inconsistent with institution's culture. Nel (2006) further suggested that, in order for development to be successful and sustainable, it should involve campus communities directly. An introduction of an EMS should thus, as stated by Sharp (2002), promote employee and staff acceptance of the EMS as these entities may, consciously or unconsciously, sabotage an EMS. Acceptance may be facilitated through education, training and communication with the employees and students and their participation in its design and implementation. Employee acceptance of an EMS will be greater where the EMS fits the organisational culture – a view supported by Sharp (2002), Kirkland and Thompson (1999) and Nel (2006). Nel (2006) suggested that, in introducing a system such as ISO 14001 EMS, the

institution must promote development close to its community's knowledge systems and with their participation.

Table 5.2 indicates that records of waste outputs, water and energy consumption are not kept. It is thus crucial that information baselines should be established to identify, track, and measure inputs (i.e., energy, water, materials) and wastes and emissions outputs. An electronic information management systems should be used, as per the suggestion by Brouwer and van Koppen (2008), to track and evaluate environmental performance. These systems measure and verify data, evaluate collected data, and identify improvement opportunities.

Monitoring results should then be documented and distributed in a timely manner to appropriate management representatives. The university campus operations should be modified in response to data findings to correct performance and meet environmental goals. Corrective actions should be tracked and verified to ensure successful completion.

"Lessons learned" programs should also be implemented to identify improvement opportunities. Unless environmental forums and awareness campaigns at the Mafikeng campus are established and undertaken respectively, this task will be a daunting one. Sharp (2002) stated that this exercise shall thus facilitate formulation of trends analyses to identify root causes of environmental performance concerns.

The Mafikeng campus should thus adopt an enhanced strategic planning framework, based on the A-B-C-D backcasting method, for use in ISO 14001 when planning for sustainable development, as MacDonald (2005) had proposed.

In conclusion, recalling the remarks by Nel (2006), introduction of the EMS should not attempt to freeze the campus community as fixed entities with inescapable essentialist characteristics as this shall lead to unfavourable results. The rich history of the Mafikeng campus of the North-West University reveals communities evolving and in flux, with an inherent strength to change and to face new circumstances.

6.2.2 The nature of the EMS to be implemented

Lack of knowledge about EMSs amongst the community of the Mafikeng campus of the North-West University may be attributed to the failure of the university curricula to adequately respond to current social, economic, cultural and environmental issues as was determined by Dewar and Shippey (2002). This is supported by the large amount of students participants, indicated in table 5.2, who are not sure about how the legal environmental requirements apply to their operations. Dewar and Shippey (2002) recommended that students be educated and thus equipped with skills that are of an appropriate standard in order to realise a sustainable future.

Furthermore, Nel (2006) indicated that the lack of community development is also a threat to their very nature and put under pressure the knowledge and spiritual fibres. It is hence most crucial to address this issue in the Mafikeng campus of the North-West University. This approach shall set a platform towards successful EMS introduction and implementation.

6.2.3 Possible barriers that can deter efforts in introducing an EMS

The Mafikeng campus of the North-West University should identify the required resources (time, money, personnel and training amongst others) for the EMS as suggested by Zutshi and Sohal (2004). This exercise is absolutely essential to ensure that initiatives can be carried out. Failure to identify, or underestimation of, necessary resources shall lead to the delay or failure in EMS implementation.

As Kirkland and Thompson (1999) and Sharp (2002) had suggested, in case the costs for implementation are beyond the university's budget constraints, the university may mitigate the EMS cost barrier by sharing resources with industry groups with similar needs. The costs may further be reduced by cooperating with like-minded companies to share consultants (for example, combining resources to hire a consultant to design and implement an appropriate EMS) or by sharing an employee (who would otherwise be too expensive for one company). Where consultants are hired to solve environmental problems, attention should be paid to having the consultant educate and train staff where appropriate. Another option, would be to use cooperative study programmes and graduate

students for assistance where qualifications, abilities and supervision make this possible.

Since environmental issues pose complex problems for organisations, the approach to these issues – environmental management systems – must eventually be appropriately complex. (This does not mean that simpler or incremental phased-in approaches are impossible or undesirable.) The university should guard against inappropriate solutions which may be advocated by some consultants who seek to obtain work with promises that they can develop an EMS with little cost and no effort on the part of the organisation. Inappropriate solutions may also be developed if individuals with little understanding of environmental management attempt to design and implement an EMS. This is in accordance with suggestions by Kirkland and Thompson (1999).

It is important for the Mafikeng campus of the North-West University to identify external and internal stakeholders and to design and implement an EMS that will handle those interests effectively and efficiently, as suggested by Sharp (2002) and Zutshi and Sohal (2004).

However, it is worth noting the findings by Herremans and Allwright (2000) that having a set of guiding principles had no statistical significance to other characteristics of the EMS. Instead the authors found that whether the Universities reported to top management and/or had full time staff responsible for environmental issues were two variables that would determine if the campus establishes itself as an environmental leader or struggler.

Thus, it is important that as a launch pad of EMS introduction, the campus first appoints full-time staff responsible for environmental issues and establish a system to allow for regular reporting to the top management.

The formulation of an Environmental Policy is not undermined by as the objectives are derived from it. However, in the opinion of Herremans and Allwright (2000), if an employee is appointed to oversee environmental initiatives, then the job description can give direction necessary for environmental actions/innovation.

Kirkland and Thompson (1999) noted that there exists a positive correlation between innovation success and its compatibility with the corporate climate. Thus it is crucial that the

full-time staff appointed for environmental issues is familiar with the culture of the Mafikeng campus and adopts the EMS to this culture.

Henriques and Sadorsky (1999) remarked that the formulation of an environmental plan is simply an outcome of a series of communications between various groups within and outside an organisation. Hence, it is important that the campus avoids being engulfed with internal meetings and communication and not overlook the importance of involving the media, surrounding communities and suppliers during the EMS introductory and implementation phase.

Kirkland and Thompson (1999) suggested that phasing in parts of an EMS may be used to overcome barriers involving lack of recognition of the value of an EMS and limited resources. Furthermore, in order for the Mafikeng campus of the North-West University to recognise the full benefits of an EMS it must put all the necessary elements in place (staging of EMS elements). Staging shall allow the university to start doing something. If some elements of an EMS are successfully introduced at the university and benefits are recognisable, resistance to other elements of an EMS may be overcome. This approach will thus eliminate dissonance between the EMS, the university, decision-makers, employees and students.

Short- and medium-range environmental performance goals, as suggested by Brouwer and van Koppen (2008), should be established for individual operations within the campus and for the campus as a whole. The authors indicated that a wide range of potential environmental impacts may be addressed through comprehensive multi-media environmental programs. These programs include, but are not limited to:

1. pollution prevention;
2. recycling;
3. reuse;
4. control;
5. compliance;
6. affirmative procurement;
7. energy conservation; and
8. emergency preparedness and response

6.3 Conclusion

Studies have shown that few organisations are willing to take the lead in implementing new concepts. By pursuing implementation of an ISO 14001 EMS in the Mafikeng campus the university would thus be taking the first step in establishing itself as a hallmark green university in South Africa.

Formal guidance should be developed and disseminated to help ensure organisational environmental excellence. Efforts should be made to combine theoretical work and practical experience and to encourage communication between affected individuals and groups while attempting EMS introduction.

Also, by focusing orientation of curricula towards environmental issues shall not only reduce the degradation and possible destruction of the environment, but shall help the institution reach its goal, namely: *“to be a pre-eminent university in Africa, driven by the pursuit of knowledge and innovation”*.



6.4 Limitations of the study

The researcher acknowledges the limitation with the study borne by lack of participation from other members of the community of the Mafikeng campus of the North-West University. Various factors, such as busy schedules; logistics pertaining to the undergoing transformation as a result of the merger process; and many others that the researcher may not be aware of, have contributed to this case. However, these factors notwithstanding, the researcher endeavoured to exercise caution in the process of sampling design so as to attempt to not compromise the reliability of data collected at the Mafikeng campus of the North-West University.

The researcher acknowledges the limitation with the sample size used ($N = 44$) which is due to the limited knowledge about EMS possessed by the population within the campus.

6.5 Recommendations

The first step towards successful introduction and/or implementation of an EMS should be establishing an Environmental Policy which should serve as a basis of promoting mutual trust, reciprocity and commitment to agreed norms and rules for behaviour. This requirement is supported by Pretty and Ward (2001) and Hansen and Lehmann (2006) who emphasised the importance of the four aspects in the social capital, namely: setting of relations of trust; reciprocity and exchanges; common rules, norms and sanctions; connectedness, networks and groups.

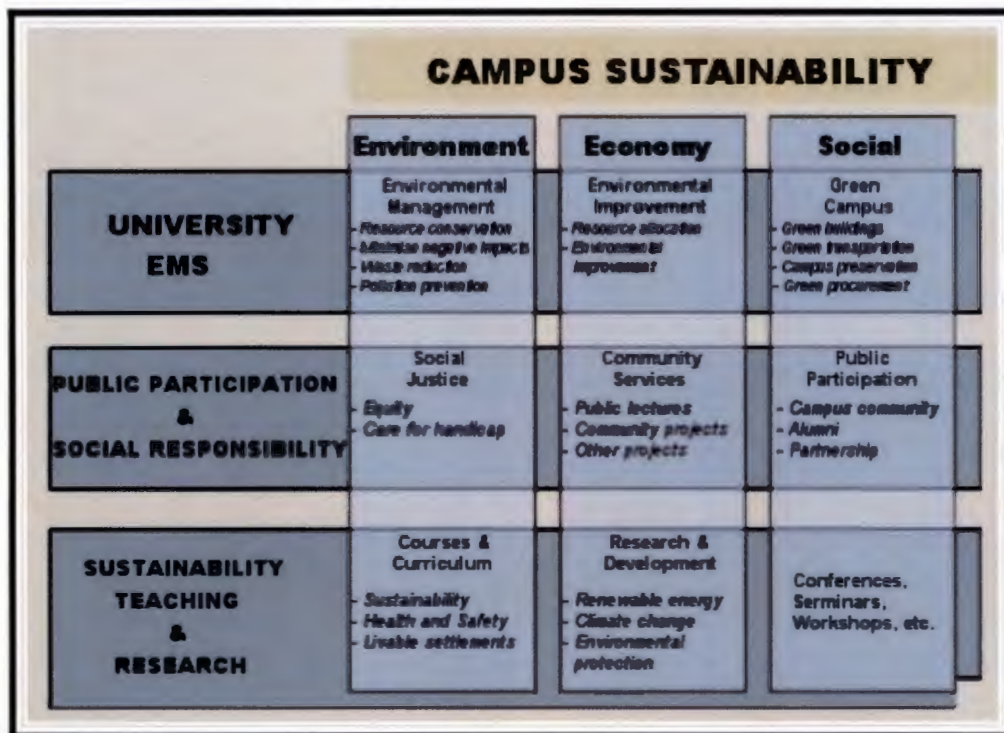
Moreover, based on the studies above, the Environmental Policy should facilitate the integrative, technological, ecological, cultural, economic and social process by which the campus environment can be developed in a holistic and systematic manner through the optimal use of existing and potential resources within the campus. The ultimate aim of such an endeavour is to improve the lives of the community of the Mafikeng campus of the North-West University. Khan *et al.* (2002) defined such a process as Environmental Management.

The elements in the above definition given by the authors are incorporated in the three parameters of sustainable development as stated by Field (2006), namely: environment, economy and equity. These parameters may then be applied to the EMS in facilitating problem identification and problem solving to facilitate managing the interaction between the organisation and the environment. This is in support of the suggestion by MacDonald (2005) that the ISO 14001 EMS may be applied as a tool to move an organisation towards sustainability.

Moreover, the top management of the Mafikeng campus of the North-West University after having approved the Environmental Policy, signed by the campus Rector, must fulfil their commitment to making resources available to identify, develop, initiate, and transfer between facilities environmental improvement technologies and strategies.

In developing the EMS, the Mafikeng campus of the North-West University should provide a continuous formulation and reformulation of social, economic and environmental actions in a feedback process. The following sustainability framework, Figure 6.1, is recommended:

Figure 6.1: Framework of the proposed approach to achieving campus sustainability.

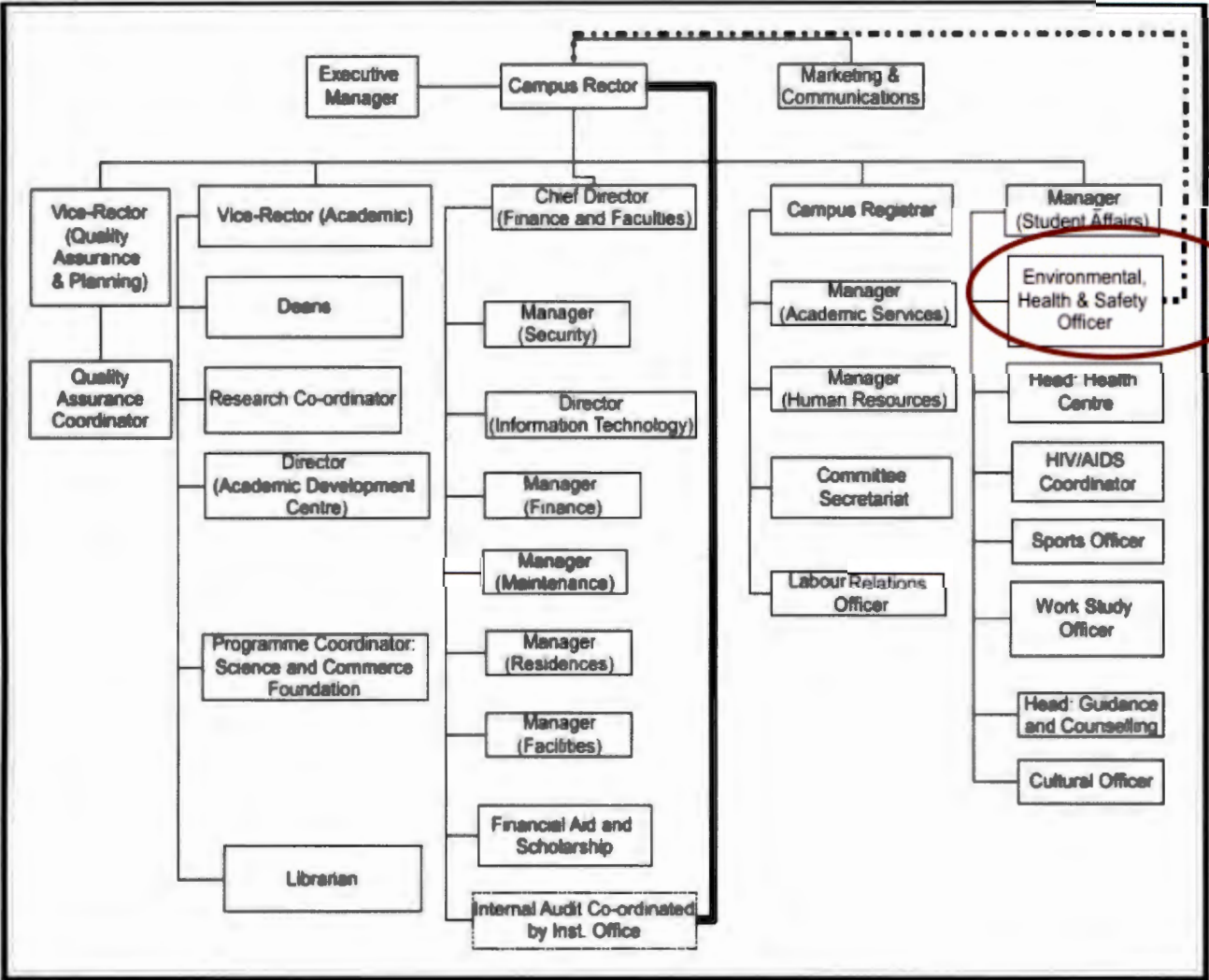


The Mafikeng campus of the North-West University should consider updating its organisational structure and to accommodate the following as required by the ISO 14001:1996 standard (Collier and Gillman, 2003):

1. organisational mission statement that sets forth environmental business focus, going beyond environmental compliance should be outlined;
2. Clear lines of authority, responsibility, and accountability should be established for environmental functions;
3. Formal systems for statutory and regulatory tracking/monitoring should be established and access to financial and legal resources must be readily available; and
4. Environmental management functions should be represented at the high(est) levels of the campus.

Figure 6.2 reflects the necessary changes that have to be adopted in the campus's organisational structure. The environmental function highlighted with a red ellipse is necessary and highlights the need to appoint a dedicated environmental, health and safety (EHS) officer as per the requirement of the ISO 14001 standard. Furthermore, provision should be made to allow the EHS officer to report directly to the Campus Rector.

Figure 6.2: A revised organisational structure of the Mafikeng Campus of the North-West University (NWU).



The specific roles of universities in promoting sustainable development have been highlighted in a number of significant declarations identified in this study. For a university campus to be sustainable, it must preserve the environment, stimulate economic growth, and improve society. It is, therefore, the duties of university management and the community to make the university environments sustainable so that the universities can serve as centers for the promotion of global sustainability for the benefit of all.

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Appendix 1: The Principles of National Environmental Management

1. Environmental management must place people and their needs at the forefront of its concern.
2. Development must be socially, environmentally and economically sustainable.
3. Environmental management must be integrated, acknowledging that all elements of the environment are linked and interrelated.
4. Environmental justice must be pursued.
5. Equitable access to environmental resources to meet basic human needs and ensure human well being must be pursued.
6. Responsibility for the environmental health and safety consequences of a project or activity exists throughout its life cycle.
7. The participation of all interested and affected parties in environmental governance is promoted.
8. Decisions must take into account the interests, needs and values of all interested and affected parties.
9. The social, economic and environmental impacts of activities must be considered, assessed and evaluated, and decisions must be appropriate in the light of such consideration and assessment.
10. Decisions must be taken in an open and transparent manner, and access to information must be provided in accordance with the law.
11. The environment is held in public trust for the people, the beneficial use of which environmental resources must serve the public interest and the environment must be protected as the people's common heritage.

12. The costs of remedying pollution, environmental degradation and consequent adverse health effects must be paid for by those responsible for harming the environment.
13. Sensitive, vulnerable, highly dynamic or stressed ecosystems, such as coastal shores, estuaries, wetlands, and similar systems require specific attention in management and planning procedures, especially where they are subject to significant human resource usage and development pressure.

Appendix 2: Listed activities as per original EIA Regulations

SCHEDULE 1:

1 The construction or upgrading of:

- 1.1 facilities for commercial electricity generation and supply;
- 1.2 nuclear reactors and installations for the production, enrichment, reprocessing and disposal of nuclear fuels and wastes;
 - 1.2.1 transportation routes and structures, and manufacturing, storage, handling or processing facilities for any substance which is dangerous or hazardous and is controlled by national legislation;
 - 1.2.2 roads, railways, airfields and associated structures outside the borders of town planning schemes;
 - 1.2.3 marinas, harbours and all structures below the high-water mark of the sea;
 - 1.2.4 cableways and associated structures;
 - 1.2.5 structures associated with communication networks, other than telecommunication lines and cables, as well as access roads leading to these structures;
 - 1.2.6 racing tracks for motor-powered vehicles and horse racing, excluding indoor tracks;
 - 1.2.7 canals and channels, including diversions of the normal flow of water in a river bed and water transfer schemes between water catchments and impoundments;
 - 1.2.8 dams, levees or weirs affecting the flow of a river;
 - 1.2.9 reservoirs for public water supply;
 - 1.2.10 schemes for the abstraction or utilisation of ground or surface water for bulk supply purposes;
 - 1.2.11 public and private resorts and associated infrastructure;
 - 1.2.12 sewage treatment plants and associated infrastructure; and buildings and structures for industrial and military manufacturing and storage of explosives or ammunition or for testing or disposal of such explosives or

ammunition.

- 1.3 The change of land use from:
 - 1.3.1 residential use to industrial or commercial use;
 - 1.3.2 light industrial use to heavy industrial use;
 - 1.3.3 agricultural or undetermined use to any other land use;
 - 1.3.4 use for grazing to any other form of agricultural use; and
 - 1.3.5 use for nature conservation or zoned open space to any other land use.
- 1.4 The concentration of livestock in a confined structure for the purpose of mass commercial production.
- 1.5 The intensive husbandry of, or importation of, any plant or animal that has been declared a weed or an invasive alien species.
- 1.6 The release of any organism outside its natural area of distribution that is to be used for biological pest control.
- 1.7 The genetic modification of any organism with the purpose of fundamentally changing the inherent characteristics of that organism.
- 1.8 The reclamation of land below the high-water mark of the sea and in inland water including wetlands.
- 1.9 The disposal of waste in terms of section 20 of the Environment Conservation Act, 1989.
- 1.10 Scheduled processes listed in the Second Schedule to the Atmospheric Pollution Prevention Act, 1965 (Act No. 45 of 1965).

Appendix 3: Letter requesting permission to conduct research

P.O. Box 772
Westonaria
1780
C: 0741121892
E: lerato@r-tech.org

Campus Rector
North-West University: Mafikeng Campus
Mmabatho
2735

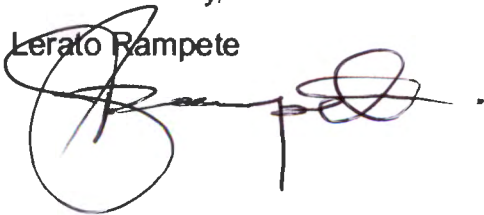
Sir

REQUEST TO CONDUCT RESEARCH

I am currently registered for Master in Business Administration (Finance) with the North-West University. Part of the requirements for this course is that students conduct research.

I therefore request permission to conduct research in your institution. The research entails implementation of an Environmental Management System (EMS) at the Mafikeng campus of the North-West University. I believe the findings of this research shall not only be helpful to our university, but to the environment as well.

Yours faithfully,
Lerato Rampete

A handwritten signature in blue ink, appearing to read 'Lerato Rampete', with a large circular flourish at the end.

Appendix 4: Memorandum requesting the organisational structure of the management of the Mafikeng campus of the North-West University

TO: Manager. Human Resource Management

FROM: Lerato Rampete (10689524)

SUBJECT: REQUEST FOR UNIVERSITY MANAGEMENT ORGANOGRAM

Sir/Madam

Herewith a request for an organisational structure of the management of the Mafikeng Campus of the North-West University.

The requested information shall be used in compiling a mini-dissertation in partial fulfilment of the requirement of the Master in Business Administration degree.

The title of the research project is, namely: Implementation of an Environmental Management System in the Mafikeng Campus of the North-West University.

Hope you find the above in order.

L. S. R. Rampete

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